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**AUTISM SPECTRUM DISORDERS (ASD) AND
CHALLENGING BEHAVIOURS (CB):
TRAINING LEVEL AND CONTENT KNOWLEDGE
OF TEACHERS IN THE REPUBLIC OF IRELAND**

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Abstract

With rising prevalence rates of autism spectrum disorders worldwide (i.e. current prevalence of 1:88; CDC 2012) it is imperative to implement efficacious interventions to improve functional outcomes for those diagnosed with autism. Applied behaviour analysis has been shown to produce advantageous outcomes (e.g. raised IQ scores, improved verbal skills, and increased adaptive behaviours; Fein, 2013; Dawson et al. 2010) and is widely accepted as an evidence-based practice for educational interventions for individuals with autism spectrum disorders (Odom, 2010).

Irish teachers of students with autism spectrum disorders were surveyed regarding their knowledge relevant to autism, challenging behaviour, and applied behaviour analysis. The data were analyzed to comparing results among respondents based on professional development training in the content areas. The teachers reporting training through the Special Education Support Service showed slightly higher rates of correct responses yet the performance of this group did not support the claimed high level of knowledge in these areas.

This study indicates a need for research to validate professional development training modules as a means of ensuring improved teacher knowledge and skills being brought to practice in classrooms for students with ASD in Ireland.

Declaration

QUEEN'S UNIVERSITY BELFAST DECLARATION FORM FOR SUBMISSION OF HIGHER DEGREE BY RESEARCH

I declare that:

(i) the thesis is not one for which a degree has been or will be conferred by any other university or institution;

(ii) the thesis is not one for which a degree has already been conferred by this University;

(iii) the work for the thesis is my own work and that, where material submitted by me for another degree or works undertaken by me as part of a research group has been incorporated into the thesis, the extent of the work thus incorporated has been clearly indicated;

(iv) the composition of the thesis is my own work.

Signed: Brian James Fennell

Date: 21 March 2014

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I would never have completed this undertaking without the emotional support of my family. My wife, Fiona has been there to pick up the pieces as well as give me a nudge in the right direction as the situation required. I know she felt like she lost a husband and gained another child at times. Over a seven-year period my children, Dáire and Aibhe, have had to deal with their Daddy hiding away in his office late into the night doing his homework. Now that it is done, I hope to be able to show them how important it was for me to have them there, waiting with a hug handy, when I emerged from slaying the dragons. I will support them in all their efforts for a lifetime in return.

1. Introduction

For several decades there has been concern over the apparently rising prevalence of autism spectrum disorders (ASD; Fombonne, 2003; Matson & Kozlowski, 2011; Wing, 1993). Although several factors have been identified as contributing to this increased rate (Fombonne, 2005) there is nonetheless a concern for the toll to be extracted from public services by the number of individuals with education, care, and health needs associated with ASD (Sharpe & Baker, 2011). With a prevalence rate estimated at 1 in 88 (CDC, 2012), the need for effective educational interventions and teachers with expertise in ASD in both mainstream and special education is more urgent than ever if the goals of inclusive education are to be met in Ireland, the UK, and globally (Government of Ireland, 2004; Parliament of the United Kingdom, 2009; United States Congress, 1997).

1.1. Autism Spectrum Disorders

As in other jurisdictions (e.g. Scotland, Dunlop et al., 2009; US, United States Congress, 1997) the Republic of Ireland has recognized the importance of educational provision for students with ASD (The Task Force on Autism, 2001) and as a result created a system of continuous professional development (CPD) training for teachers in this area (Special Education Support Service, 2014). Researchers have engaged in the study of effective educational practices for students with ASD across the globe (Jones, 2002; Odom, Collet-Klingenberg, Rogers, & Hatton, 2010; Parsons et al., 2009) without achieving consensus on the matter. Irish government and departmental policy on educational programmes for ASD has continued to support an eclectic approach to education of these students (Parsons et al., 2009) while major developments in the US have seen a dramatic shift in the application of evidence-based practices for educating students with autism (Maine Administrators of Service for Children with Disabilities, 2000; National Standards Project, 2009).

The prominence of ASD has extended beyond educational concerns to broader societal awareness and inclusivity (Jordan, 2010; Ortega & Choudhury, 2011) to an extent that global awareness projects feature in social media and mainstream entertainment outlets (Autism Speaks, 2014; Hill, 2013; Huffington Post, 2014). Despite the increased awareness of ASD among the general population, there still exist misinformation and erroneous public beliefs about ASD (Dillenburger, Jordan, McKerr, Devine, & Keenan, 2013; Watkins, 2012). The inaccuracies are nowhere more evident than in the area of effective educational programmes and the collection of empirical data.

1.2. Applied behaviour analysis

With a long historical base as the natural science of behaviour, applied behaviour analysis (ABA) has acquired several decades of experimental data supporting its usefulness as an intervention in a large variety of fields (e.g. healthy eating programmes, pet obedience training, and school discipline procedures) and across a wide range of target populations (e.g. animals, motorists, and athletes). Currently, however, the use of ABA methods is most generally associated with behavioural programmes for students with autism spectrum disorders (Dillenburger & Keenan, 2009).

As a basis for educational interventions for students with ASD, behaviour analysis has accumulated a vast foundation of empirical support (Dawson et al., 2010; Eikeseth, Smith, Jahr, & Eldevik, 2007; Lovaas, 1987). In fact, recent research has reported significant improvement in outcome measures for young people through ABA interventions to the extent that many in the study were no longer diagnosed with the condition (Fein et al., 2013; Kelley, Naigles, & Fein, 2010). While these optimal outcomes for children through ABA interventions are by no means achievable for all people with ASD, the data has supported the classification of ABA as evidence-based practice in ASD intervention and best practice for the educational programmes for this population (Mitchell, 2008; Odom et al., 2010).

1.3. Challenging Behaviour

In Ireland (Irish National Teachers Organization, 2004; Kelly, Carey, McCarthy, & Coyle, 2007) as well as other nations (Canada: McCready & Soloway, 2010; UK: Ofsted, 2005; US: Thompson & Webber, 2010) schools have been addressing concerns over student indiscipline for several decades (Algozzine & White, 2002; Maag, 2001). The concern regarding challenging behaviour is not limited to special education programmes nor is it restricted to primary level in the Republic of Ireland (Irish National Teachers Organization, 2004; Task Force on Student Behaviour, 2006).

Schoolwide behavior policies have begun to implement elements of positive behaviour support (Doody, 2009; National Behaviour Support Service, 2013) in Ireland while whole school districts in the US have implemented the Schoolwide Positive Behaviour Support (SWPBS) procedures (Bradshaw, Mitchell, & Leaf, 2010) in a concerted effort to address the issue of student behaviour. The SWPBS programme, having its basis in ABA methods, uses positive reinforcement of socially appropriate behaviours, direct teaching of desirable behaviours, and individualized assessment of intervention needs (Sugai & Simonsen, 2012).

1.4. Teacher knowledge in the content areas

Teachers of students with ASD in Irish schools have been given access to a focused curriculum of professional development opportunities as a result of the reports on the literature around educational interventions for students with autism (Parsons et al., 2009; The Task Force on Autism, 2001). The programme of training has been provided by the Special Education Support Service (SESS) since its inception in 2003 (Special Education Support Service, 2013) and a full calendar of seminars and workshops are presented annually (Special Education Support Service, 2014). Despite the focus on educational interventions for ASD and the implementation of extensive continuous professional development for teachers instructing students with ASD, little data has been gathered as to the efficaciousness of these efforts (Banks & Smyth, 2011; Price, Waterhouse, and Coopers LLB, 2012).

The standard practice in CPD training in Ireland has been to collect participant satisfaction data (Egan, 2004) with no collection of learner outcome or change of classroom practice data. The lack of data on effective learning outcomes as a result of seminar participation has left the task of empirical evaluation of the service provision in this area problematic (Price, Waterhouse, and Coopers LLB, 2012). While teachers of students with ASD in the current research report a high level of knowledge in the areas of ASD and challenging behaviours a test of this knowledge does not support this level of confidence. More modest self-reported knowledge of ABA procedures was measured against similarly poor performance on the ABA knowledge section of the current survey.

The current research presented participating teachers of students with ASD with content knowledge questions in the form of a survey. This survey offers several questions with a varying degree of difficulty and in several different formats (i.e. true/false, multiple choice, and open-ended questions). The areas of concern in this research are autism spectrum disorders, challenging behaviour, and applied behavior analysis. The content areas are examined by nine questions regarding ASD and ten questions for challenging behaviour and ABA each.

The purpose of the current research is to test participating teacher knowledge in the key content areas for educational interventions for students with ASD. Survey results are analyzed by comparing the responses of participants based on training provider in the content area of consideration. The comparison groups consists of those who had received training by the Department of Education and Skills provider, the Special Education Support Service, those with training by other providers, and teachers with no specific training in the content area in question.

1.5. Chapter layout

The introductory chapter is followed by an extensive literature review of research to date in several key areas of interest to the current research. Chapter 2 focuses on the most recent findings in the area of autism spectrum disorders. This includes current prevalence rates for ASD and the latest aetiological perspective on the disorder. The chapter on ASD also discusses recent developments in the role of autism in mainstream culture and the alternative culture of neurodiversity and autistic self-advocacy.

Despite its stature as the science of behaviour, applied behaviour analysis has become known as a treatment method for individuals with ASD. Chapter 3 gives a brief history of ABA and an introduction to several of the elementary technologies consistent with the application of the science of behaviour. Further discussion is pursued regarding the research of ABA evidence-base of effectiveness for educating individuals with ASD, the insurance coverage issue for ABA services, and the recognition/legislation for qualification of ABA professionals in the context of the US. These developments are reviewed as a comparison to the limited availability of ABA services and prohibitive costs associated with the application of the science in Ireland.

Chapter 4 considers the literature in the field of challenging behaviour with regard to definition, prevalence, and the effect of school discipline policies of student behaviour. Included in this discussion is the use of school-wide positive behaviour support (SWPBS) as a programme developed through ABA methodologies. The application of SWPBS through several Irish educational support services is detailed. The chapter concludes with an examination of another ABA-based technology, functional behavioural assessment (FBA). The methods of FBA are presented along with several issues for consideration in the use of these assessment procedures.

While there is near unanimity of support for the principles of inclusion as a social concept, Chapter 5 presents the current literature in this area in regard to the education of students with special educational needs in Ireland as well as a

comparison to practices in the UK. This final chapter of the literature review concludes with a consideration of inclusive education and its affect on the current provision of initial teacher education (ITE) and continuous professional development (CPD) for teachers in schools in the Republic of Ireland.

Chapter 6 provides a description of the research methodology for the current study. Participant demographics are detailed and research tools and procedures are presented.

The methodology chapter is followed by the presentation of research results in Chapter 7. This chapter proffers the data obtained by surveying 166 teachers of students with ASD in Irish schools. Each item of the survey is presented in table-form with comparison between three sample groups: respondents with no training, those with training from the Special Education Support Service (SESS), and those with CPD provided by other sources. The data for each item and for each section is analyzed to compare results for the knowledge of participants around the key content areas of ASD, challenging behaviour, and ABA.

The discussion of key findings, research limitations, and recommendations for future studies are presented in Chapter 8. The knowledge of concepts in the areas of ASD, challenging behaviours, and ABA are reviewed as well as the use of best practice methods as recommended in the literature. Future changes to the ITE and CPD structures for Irish teachers are propositioned as well as future research opportunities with a focus on evidence-based studies on training efficacy in the SEN sector of Irish education.

2. Autism Spectrum Disorders

2.1. Introduction

While the first appearance of the term autism as an identifying moniker for a group of individuals with very specific symptomologies may be attributed to psychiatrists of the twentieth century, individual cases have been evident well before that time (Wolff, 2004). However, it was not until the American psychiatrist Leo Kanner (1943) labeled the phenomenon among his patients that autism became a focal point of wider scientific investigation.

Contemporaneous to Kanner's research and independent of it, the paediatrician Hans Asperger (1944) noted similar common traits among his own research subjects in Austria. However his work was virtually ignored by the international community until it was posthumously translated into English by Frith (1991). Based on the pioneering works of these two scientists, a growing volume of research developed from the 1960's through the 1980's (Wing, 1996). It was following this initial wave of research interest that diagnostic classification was to become formalized for the first time in the Diagnostic and Statistical Manual of Mental Disorders- Third Edition (American Psychiatric Association, 1980).

The diagnostic category of ASD has had multiple subgroups within this designation. Although changing over time, recently included subgroups were: autistic disorder, Rett's disorder, childhood disintegrative disorder, Asperger's disorder, and pervasive developmental disorder- not otherwise specified (PDD-NOS; American Psychiatric Association, 1994). Both the Diagnostic and Statistical Manual (DSM-IV) and International Statistical Classification of Disease and Related Health Problems-10 (World Health Organization, 1990) classified these disorders under the heading 'Pervasive Developmental Disorders'.

The DSM5 (American Psychiatric Association, 2013) represents a radical revision of previous classifications by not using subgroups but one diagnostic category: autism spectrum disorders. This means that Asperger's disorder and PDD-NOS will no longer be diagnostic labels but individuals with these symptomologies will be diagnosed under the global ASD classification (Lord & Jones, 2012). Autism spectrum disorder is now diagnosed using two symptom domains (i.e. impaired social/ communication and restricted, repetitive behaviours; American Psychiatric Association, 2013) rather than the three previous criteria known as the Triad of Impairments.

2.2. Terminology

In accordance with the literature in the field (Bertrand et al., 2001; CDC, 2009; Williams et al., 2005) and in line with DSM5, the term autism spectrum disorder (ASD) will be used throughout this thesis. In this thesis, when comparisons are made to research published prior to the release of ASD criteria in DSM5, care has been taken to include only autistic disorder, Asperger's disorder and pervasive developmental disorder- not otherwise specified. Inclusion of Rett's and childhood disintegrative disorder (CDD) in studies carried out before 2013 may make correlation impracticable. However, incompatibility of research methodology is lessened by the fact that, in recent years, Rett's and CDD were generally excluded from research in the area of ASD and not included in this collective label (Rutter, 2005). Where earlier literature makes reference to a subgroup recognized under previous editions of the diagnostic systems (e.g. Asperger's syndrome/disorder) this will be specified in this thesis in order to maintain the integrity of the original research.

Prior to DSM5 (American Psychiatric Association, 2013), common terminology for autistic disorder included autism and Kanner's autism (Gillberg & Wing, 1999) and usually referred to those on the autism spectrum with more severe disabilities. Asperger's syndrome was frequently used in place of the Asperger's disorder (Bertrand et al., 2001; Williams et al., 2005) and both usually referred to those with

milder disabilities. Earlier research has referenced pervasive developmental disorder-not otherwise specified (PDD-NOS; CDC, 2009; Newschaffer & Curran, 2003) or atypical autism (Holtmann, Bolte, & Poustka, 2007) for diagnoses not fitting other subgroups within the category.

2.3. Diagnostic and Statistical Manual

The American Psychiatric Association has published several revisions of diagnostic criteria for mental disorders since 1952. While DSM5 (American Psychiatric Association, 2013) has set a new standard for ASD diagnosis it is important to understand the historical developments that brought researchers and diagnosticians to this point in the evolution of ASD classification.

The early use of a descriptive label of autism emanated from the original descriptions of Kanner's (1943) patients. Researchers in the 1960's and 1970's using this descriptive criteria often found it to be restrictive in case identification (Fombonne, 2005; Wing & Potter, 2002). As a result, autism was first included in the DSM-III (American Psychiatric Association, 1980). This volume included the triad of impairments (Wing & Gould, 1979) by organizing its diagnostic criteria for autistic disorder into three categories: impaired socialization, impaired communication and impaired imagination.

Although the triad of impairment remained relevant until the DSM5 (American Psychiatric Association, 2013) revisions, the actual elements that make up the criterion for ASD diagnosis did not remain static. For example, the third component of the triad has seen several iterations with a shift away from a focus on impairment of imagination towards stereotyped or repetitive behaviours (American Psychiatric Association, 1987). It was the variation of degree of impairment in each area that gave rise to the concept of the autism as a spectrum of deficits (Wing, 1996). And this concept is retained in the global category of autism spectrum disorder under DSM5 (American Psychiatric Association, 2013).

Use of the triad of impairments for diagnostic purposes was not without difficulties in practice. Often symptoms observed in individuals with ASD could be placed in multiple symptom domains (Lord & Jones, 2012; Ozonoff, 2012). Deficit assignment to the social or communication domains posed the greatest level of confusion (Lord & Jones, 2012) as the same symptoms could be placed under either heading. DSM-5 (American Psychiatric Association, 2013) reduced the triad to two symptom domains consisting of social/ communication deficits and restricted repetitive behaviours. This change was seen to be retrograde by some (Wing, Gould, & Gillberg, 2011) but supported by others in the field for its utility in practice (Lord & Jones, 2012; Tanguary, 2011).

With the aid of Frith's (1991) original translation the work of Hans Asperger became more widely researched in English speaking countries (Wing & Potter, 2002) and culminated in the first inclusion of Asperger's syndrome in the DSM-IV (American Psychiatric Association, 1994). This diagnosis was differentiated from autistic disorder and required evidence of social impairment and repetitive, stereotyped behaviours but without communication deficits or cognitive delays.

The immediate predecessor of DSM5 (American Psychiatric Association, 2013) was a revision of DSM-IV (American Psychiatric Association, 1994). The DSM-IV-TR (American Psychiatric Association, 2000) had five subcategories of ASD under the collective category of pervasive developmental disorders. These subcategories were eliminated in the DSM5. During the field trial phase of DSM5 great debate amongst professionals, parents, and individuals with ASD often became contentious.

While the termination of the triad of impairments in favour of a diad approach was lamented by some (Wing et al., 2011) the central focus of the discourse for some researchers (e.g. Happé, 2011) was the elimination of ASD subgroups in DSM5 (American Psychiatric Association, 2013). Primarily concerned with the effects of

the removal of Asperger's syndrome as an identified diagnosis, many feared the loss of services for those with greater capabilities on the spectrum (National Autism Association, 2014). The particular difficulties in diagnosing Asperger's syndrome has been a motivating factor for the changes in DSM5 (Happé, 2011) and supported in the literature (Frazier et al., 2012; Skuse, 2011). However, there is real concern that the standards set in DSM5 will leave out many previously included in this group making them ineligible for intervention services (Frazier et al., 2012; Wing et al., 2011).

A recent study (McPartland, Reichow, & Volkmar, 2012) has determined that only 60.6% of those with an ASD would be identified under DSM5 criteria. The same research indicates only 25% of those with a previous diagnosis of Asperger's syndrome would qualify under the updated protocol. Other research has called for a lowered threshold of criteria for qualification as a means of increasing identification while maintaining sensitivity for cases previously diagnosed as Asperger's syndrome (Frazier et al., 2012).

2.4. International Classification of Disease (ICD)

The World Health Organization (WHO) produces a diagnostic tool for medical professionals that is widely used internationally, the International Classification of Disease and Disorders (ICD). The current edition of this text, ICD-10 (World Health Organization, 1990), addresses the issue of ASD under the heading pervasive developmental disorders (PDD), including ten subcategories: childhood autism, atypical autism, Rett syndrome, other childhood disintegrative disorder, overactive disorder associated with mental retardation and stereotyped movements, Asperger's syndrome, other pervasive developmental disorder, and pervasive developmental disorder, unspecified.

The ICD-10 (World Health Organization, 1990) diagnostic criteria for Asperger syndrome has been criticized as being overly restrictive (Ghaziuddin, Tsai, &

Ghaziuddin, 1992; Leekam, Libby, Wing, Gould, & Gillberg, 2000) when compared to Asperger's own case notes (Asperger, 1944; Frith, 1991). This discrepancy results in diagnostic uncertainty especially within the Asperger syndrome subcategory as noted above in relation to DSM5 revision.

The DSM-IV (American Psychiatric Association, 1994) and ICD-10 (World Health Organization, 1990) had many similarities and over successive iterations correspond in their diagnostic criteria to a high degree (Fombonne, 2005). The revisions in the DSM5 (American Psychiatric Association, 2013) diagnostic criteria for ASD have introduced a significant discrepancy between these two diagnostic systems and it remains to be seen how WHO will respond in the revisions for the ICD-11 expected in 2015.

While these manuals are pre-eminent and crucial to researchers and diagnosticians, they have been designed for use by medical professionals. Alternatively, a range of assessment instruments have been developed for less restricted use in the community (e.g. schools, playgroups) based on the criteria set forth in the diagnostic guides (Schopler, Reichler, DeVellis, & Daly, 1980).

2.5. Other diagnostic assessment tools

Community based professionals (e.g. paediatricians, educators, and community health nurses) are often the first professionals approached by parents with questions regarding developmental issues of children (Howlin, 1998). Many of the screening instruments used by these professionals have been developed with direct correspondence to the criteria in the contemporary diagnostic manuals DSM and/or ICD.

Childhood Autism Rating Scales (CARS; Schopler et al., 1980) is designed for ages 2 and older with the additional requirement that the subject has a mental age above 2

years. There are 15 items on the scale and it is administered using direct behavioural observation. This instrument is intended to distinguish ASD from other intellectual disabilities and differentiate mild/ moderate from severe ASD. The authors recommend this scale for use by physicians, special educators, school psychologists and speech language therapists.

Like the CARS, Autism Diagnostic Interview- Revised (ADI-R; Lord, Rutter, & Le Couteur, 1994) is intended for those over the age of 2 years and is recommended as part of formal diagnostic procedures and educational planning. There are 93 items across 3 domain areas: language and communication, reciprocal social interactions, and restricted, repetitive, and stereotyped behaviours and interests. With an expected duration of 1.5 to 2.5 hours, the authors recommend administration by experienced interviewers. The ADI-R (Lord et al., 1994) is used to support ASD diagnosis, to differentiate between ASD and other intellectual disabilities, and to define subgroup boundaries.

In contrast to ADI-R (Lord et al., 1994), Autism Diagnostic Observation Schedule (ADOS; Lord et al., 1989) is expected to be completed in 35- 40 minutes. It is less highly structured and relies on observation of social and communication behaviours. This instrument includes 4 separate tests based on age and expressive language capabilities of the child. It is not appropriate for adults or non-verbal adolescents. The scoring rubric differentiates between atypical autism (PDD-NOS) and autism.

While these instruments are designed for screening purposes and play a role in the formal diagnostic process, they each have a lower-limit age of two years. Efforts to develop assessment tools for earlier diagnosis are recommended in order to improve interventions for younger children and improve outcomes (Lord & Bishop, 2010). Earlier diagnosis, however, requires methods designed specifically for children presenting less than 24 months of age (Matson, Rieske, & Tureck, 2011).

Research efforts in early diagnosis have produced some methods showing promise. Interventions focused on dimensional deficits common in ASD (e.g. facial processing, sensitivity to social rewards, motor imitation) have been suggested as potentially applicable at early ages when brain development is occurring (Dawson et al., 2002). Videotape records have been successfully used to differentiate one-year old children with ASD from typically developing and intellectually disabled subjects based on social communicative behaviors (e.g. responding to name, attention to objects held by a person) and repetitive motor behaviours (Osterling, Dawson, & Munson, 2002). Computer-based data collection for visual tracking behaviour was part of another study successfully identifying subjects at 12 months who were later assessed with ASD (Zwaigenbaum et al., 2005). While potential exists among these and other methodologies, further research is necessary for development of replicable results across settings and populations.

2.6. Aetiology of autism spectrum disorders

Although the causes of autism spectrum disorders are currently unknown, biomedical research in this area continues to narrow the search to genetic factors (Pickler & Elias, 2009). The origins of the condition have been debated since Kanner's original research of 1943. Over the years new sources of information have added to the debate yet some of the old theories have remained.

Kanner, after his initial observations of his patients, drew a connection between their condition and the limited bonding by the mothers and fathers. He noted that the lack of social interaction exhibited by the children was possibly related to parental characteristics but added that this disassociation existed in the children very early in life (Kanner, 1943). Despite concluding that his subjects were born with an innate disability to establish emotional bonds, Kanner has come to be seen as the main proponent of the theory of "refrigerator mothers" as the origin of the autistic condition (Stratheam, 2009).

This theory was championed by Bruno Bettelheim (1967) who argued that those with autism are similar to concentration camp prisoners as both groups did not have the opportunity to develop sociable personalities. Even though this position has been debunked as an aetiological theory of autism and related disorders (Strathearn, 2009; Wing & Potter, 2002; Wolff, 2004), there still persists today some who extol the veracity of this thesis. In Ireland, Dr. Tony Humphreys has made national media headlines by perpetuating this stance and discrediting genetic research into the biological causes of ASD (Humphrys, 2012).

One parent's response on an internet comment board exemplifies the effects felt by these controversial comments:

I'm the mum of a recently diagnosed child with Asperger's...this man has done nothing to help parents like me, all he has done is cause pain and guilt in making us believe we are somehow to blame. I am glad he was given a chance to clarify his comments in the article he wrote but he has a long way to go to undo the damage he has done.

(TheJournal.ie, 2012)

Irish Minister for Health and father of an adult son with ASD, James Reilly, MD referred to the article by Tony Humphreys as outrageous and hurtful to his own family situation even 25 years after diagnosis.

The search for causal factors in the rise in ASD diagnoses has produced a knee-jerk reaction against established medical treatments of other childhood diseases (Matson & Kozlowski, 2011). A report drawing links between the triple vaccine administered for measles, mumps and rubella (MMR) to ASD type symptoms in research subjects was published in the UK. In particular, thiomersal, a mercury derivative, was the factor deemed responsible for many cases of ASD (Wakefield et al., 1998).

Independent scientific investigation has failed to show any link between the vaccine, its ingredients and ASD (Kaye, del Mar Melero-Montes, & Jick, 2001). Furthermore, most of the vaccines in question have been altered to remove the mercury containing agents over the past ten years or more. Despite the elimination of thiomersal, the

perceived rise in ASD prevalence has not abated (Rutter, 2005). The research in question was eventually discredited and the principle author was removed from the UK medical registry as a result of gross misconduct and falsifying data (Godlee, Smith, & Marcovitch, 2011).

However, there have been cases of compensation for MMR induced autism. Under the US government Department of Health's Vaccine Injury Compensation Program, the Omnibus Autism Proceeding, a series of six test cases from the large number filed, ruled that MMR and Thiomersol were not causal agents of ASD injury and awarded no compensation in 2010 (Kirkland, 2012). However, 83 successful cases for injuries resulting from vaccinations detailed ASD or ASD-like symptoms as cause for compensation. The official reports provided by government sources, however, list encephalopathy and residual seizure disorder as the contributing medical conditions for compensation (Holland, Conte, Krakow, & Colin, 2011).

This research inspired many caring, well-meaning parents to withhold vaccinations from their children while others considered the administration of this medication as a contributing factor in the eventual diagnosis of ASD in their children (Wolff, 2004). In addition to being credited as the source of the perceived rise in the prevalence of ASD worldwide in recent years, the reported link between the MMR immunisation and ASD may also have served to divert research efforts and funding from other plausible causal factors for ASD (e.g. genetic investigations). Much research effort was required over the decade from the original publication to its retraction to duplicate, then refute Wakefield's findings (Godlee et al., 2011).

Early research has produced results indicative of a genetic component to ASD. A study of identical twins has found a higher rate of ASD or similar attributes in the twin of a subject diagnosed with ASD (Folstein & Rutter, 1977). These studies show higher rates of ASD among monozygote twins, identical twins who share the same genetic make-up, than that found among dizygote (i.e. fraternal) twins (Bailey et al., 1995).

Propelled forward by this research, there have been modest advances in the genetics of ASD in recent years with only 10% of cases linked to specific genetic factors and 400-1000 genes implicated (Newschaffer et al., 2007; Pickler & Elias, 2009). In 5% of ASD cases studied a chromosomal anomaly (e.g. Fragile X, tuberous sclerosis) can be detected (Rutter, 2005). However, this finding does not appear to have implications for the preponderance of those affected by ASD (Pickler & Elias, 2009).

Along with the genetic research, the search continues for environmental factors in the aetiology of ASD. In the case of twin studies, there is an increased prevalence of ASD among identical twins, indicative of a genetic component. However, the fact that the incidence of ASD is not 100% among monozygote twins where only one twin is affected would indicate other determinants are influential in the development of ASD (London & Etzel, 2000; Newschaffer et al., 2007). Environmental factors including in utero events are thought to have an influence on the occurrence of ASD (Herbert, 2005).

Potential in utero issues include maternal diet, medications, stress levels, toxins and disease (Newschaffer et al., 2007). For example, in utero exposure to retinoids (e.g. vitamin A) have been viewed as a possible contributory factor in ASD but insufficient research has been carried out on this theory (London & Etzel, 2000). A proposed link between prenatal maternal stress, particularly during the 28th week of gestation, and an ASD diagnoses had inconclusive results (Claassen, Naude, Pretorius, & Bosman, 2008). While research of in utero factors have been sparse, environmental causes in general have been more prominent in the literature in recent years (e.g. MMR vaccines, Thimerosal; Rutter, 2005).

The hypothesis that ASD is caused by environmental factors acting in concert with a genetic predisposition of individuals to develop the disorder has garnered much support (Lord & Bishop, 2010; Newschaffer et al., 2007; Rutter, 2005). For example,

research into oxytocin levels in subjects with ASD show reduced levels of this hormone in the blood (Green et al., 2001) and therapeutic doses of oxytocin can improve repetitive behaviour traits in recipients (Hollander et al., 2007). However, oxytocin deletion is not present in all subjects studied and medically administered hormones are not consistent in their affect. This outcome requires further research of environmental influences on oxytocin in ASD (Gurrieri & Neri, 2009).

Ascertainment of cases involving ASD due to genetic anomalies have implications for recurrence rates of ASD in families (Pickler & Elias, 2009). However, caution is advised by researchers due to the unknown role of possible gender specific environmental influences (Williams et al., 2009). Impact of environmental factors (e.g. prenatal maternal hormone levels) is theorized as a possible contributor to higher ratio of males in ASD populations (Newschaffer et al., 2007).

2.7. Prevalence of autism spectrum disorders

Since Kanner first studied the population he referred to as having ‘early infantile autism’ in 1943, researchers worldwide have addressed the issue of prevalence of autism spectrum disorders in their respective populations (Fombonne, 2005; Gillberg & Wing, 1999; Wing & Gould, 1979). Over the past four or five decades the prevalence of ASD has been increasing worldwide: 1.16% in the UK (Baird et al., 2006) and 0.67% in a US study of Brick Township, NJ (Bertrand et al., 2001) compared to 1.1% in a US nationwide survey (Kogan et al., 2009). This trend has been popularized in media sources as an epidemic of autism (Fombonne, 2001).

While most studies have focussed on the prevalence (i.e. total number in a population at a given time) of ASD, only a few have considered the incidence (i.e. number of cases newly diagnosed in a given period) of ASD. Research into the incidence of ASD in California, for the age cohort birth to 9 years of age, indicate an eightfold increase from 1990- 2006 (Hertz-Picciotto & Delwiche, 2009). In the UK, ASD incidence was estimated as increasing fourfold from 1988- 1993 among 2 to 5

year old boys (Kaye et al., 2001). Rates of ASD incidence in two Australian states were reported for a 19 month period between July 1999 and December 2000. These rates showed increased incidence across all ages, from birth to 14 years of age, in both localities (Williams et al., 2005).

Each of these studies used dates of diagnosis to determine case ascertainment rather than symptom onset data. This methodology can provide inaccurate results of observed annual increase in ASD cases (Wing & Potter, 2002). The difficulties presented by obtaining accurate symptom onset information leads most researchers to study prevalence rate of ASD for improved accuracy.

It may be more beneficial to estimate the number of individuals affected by ASD at a given time, rather than new diagnoses, due to difficulties in determining age of onset of symptoms at diagnosis (Wing & Potter, 2002). Reported prevalence of ASD has ranged from 2-5 per 10,000 throughout the 1960's and 1970's and increasing to 9 per 10,000 in the mid-1980's (London & Etzel, 2000). The rate of annual increase of ASD has been reported as 3.8% based on a review of 20 studies of ASD prevalence (Gillberg & Wing, 1999).

This trend of rising ASD prevalence rates has continued in recent years. A rate of 1 per 110 (0.90%) for children age 8 was recorded in the US (CDC, 2009) while another US investigation of all school-aged children reports 1.1% prevalence (Kogan et al., 2009). In 2012 this figure was revised to 1:88 (CDC, 2012). In the UK, a 2006 study estimated 1.16% of 9-10 year old children has an ASD (Baird et al., 2006) compared to a rate of 1.57% of students from 5-9 years of age (Baron-Cohen et al., 2009). The first study of this type carried out in South Korea has found a 2.64% prevalence rate of ASD among 7 to 12 year olds (Kim et al., 2011).

Previous studies have concluded that the reported rates may have been underestimates due to under-reporting of the atypical categories of the disorder

(Fombonne, 2005). The methodology of ASD prevalence research over the years has been the cause of some concern due to changing case identification criteria, inclusion of different ASD subcategories, and lack of longitudinal studies of populations (Lord & Bishop, 2010). Due to confounding variables, discussed below, this research may not be appropriate as a baseline by which to measure ASD population growth (Newschaffer et al., 2007).

2.8. Confounding Variables

Research into the prevalence trends for ASD face many hurdles that can effect the accuracy of the results (Fombonne, 2003), including changing diagnostic criteria, differences in study methodologies and an increased awareness of ASD among parents, professionals and the general public (Wing & Potter, 2002). These factors need to be considered (e.g. only making comparisons across studies with similar ASD subgroup inclusion and with similar diagnostic criteria) when ASD prevalence studies are used to show time trends (Fombonne, 2005; Gillberg & Wing, 1999; Wing, 1993).

Early studies of the epidemiology of autism, carried out in the 1960's and 1970's, tended to use the descriptive accounts of early infantile autism provided by Kanner (1943), Lotter (1966), and Wing and Gould (1979) are examples of such studies. The use of this criterion resulted in a restricted diagnostic measure of autism and low rates of prevalence (Fombonne, 2005).

Many different criteria have been used as determinants of case definition including: Rutter's Criteria (1978), DSM-III (American Psychiatric Association, 1980), DSM-III-R (American Psychiatric Association, 1987), ICD-10 (World Health Organization, 1990), and DSM-IV (American Psychiatric Association, 1994). As the criteria have become more inclusive prevalence rates increased upto threefold and account for a portion of the rise in ASD (Fombonne, 2005).

Methodology of prevalence research can also provide barriers to comparison of data. The only prevalence study of ASD in Ireland to date (McCarthy, Fitzgerald, & Smith, 1984) requested data on patients presenting with ASD from every child psychiatrist and all care institutions in Ireland. The researchers summarised that autism was unlikely to be missed by these sources due to its severity and therefore did not include measures to identify new cases in their population. The method of obtaining data excluded this study from comparative research of prevalence studies (Gillberg & Wing, 1999; Wing, 1993). Methodological inequities in the research make it impossible to draw definite conclusions about trends in ASD prevalence (Fombonne, 2001).

The US Department of Health and Human Services (CDC, 2009; CDC, 2012) has controlled confounding variables by collecting prevalence data using consistent methodologies and case definitions since 2000. The most recent reports issued from this project show rising prevalence rates of ASD for the centers included in the study. The change in prevalence in data collected in 2008 represents an increase of 23% over 2006 and 78% increase on 2002 (CDC, 2012).

The dramatic increase in numbers of people with ASD has given an urgency to research devoted to establishing the causes of ASD, preventative measures to stem the rising ASD population numbers, and appropriate interventions for those diagnosed with ASD. There is now an imperative to improve outcome for those with ASD while enabling the public health and education system to better cope with the increased needs of persons with ASD (Lord & Bishop, 2010).

2.9. Popular Culture and Autism

Over recent years the perceived rise in prevalence of autism spectrum disorders (ASD) has been identified (Fombonne, 2001), potential causes have been considered (Wing & Potter, 2002), and the effects this phenomenon has had on society have been examined (Autism Speaks, 2013b; Zane, 2008). The increase in diagnosis of

ASD over recent decades has been partly attributed to the increased awareness of the disorder by the general public (Wing & Potter, 2002). The availability of resources on ASD to a wider audience through Web-based technology has undoubtedly had a role to play (Jordan, 2010). Along with the increased number of those diagnosed on the spectrum, there is a corresponding increase in demand for services and further funding is required (Newschaffer & Curran, 2003).

The emergence of a culture of autism can be viewed as both a cause and effect of the changes evident in the literature on ASD. For example, the proliferation of charitable organizations focused on autism may have contributed to raised public awareness of the condition (Dillenburger, Jordan, McKerr, Devine, & Keenan, 2013) and, conversely, the larger number of individuals and families affected by ASD harkened the need for more support agencies (Mandell & Salzer, 2007). The effects of these cultural influences on and from the population on the autism spectrum are important factors for educators in Ireland working with students with ASD. Educators have embrace diversity and cultural awareness in schools at all levels. It is equally valid to promote awareness of the burgeoning autistic culture in an ASD class environment, as it is to incorporate Spanish culture in an English language learner environment.

Mainstream culture in the US and UK has also been affected by the increased awareness of ASD. Reports are common, both in research journals and mass media, regarding the financial impact of ASD. The lifetime cost of ASD borne by individuals (i.e. lost potential income), families (i.e. expenses incurred providing care), and society (i.e. through services provided throughout childhood and adult life) has contributed to a worldwide proliferation of autism charities (Ganz, 2007; Knapp, Romeo, & Beecham, 2007). Ganz (2007) estimates that the US, as a society will spend \$3.2 million over the lifetime of each citizen with ASD. In the UK, £2.7 billion is spent on provision of services, lost wages of the person with ASD, and expenses to the family supporting them (Knapp et al., 2007). Almost 60% of the cost to UK society comes in the form of services provided for those with autism. These cost analyses have not taken into account the cost of much needed research into medical treatments and educational interventions.

The goodwill shown to these charities and members of the ASD community is not beyond reproach, however. Issues regarding the rhetoric of fundraising campaigns and disability rights advocates threaten to split the charities from the population they support (Autism Self Advocacy Network, 2014). Public awareness campaigners risk alienating large groups of people with ASD who do not identify with the chosen face of the campaigns (Heilker, 2012; Stevenson, Harp, & Gernsbacher, 2011). Finally, diversity among the global population extends into subgroups such as those on the autism spectrum. Advocates for diversity, neurodiversity, and human rights need to be inclusive within their own groups (Jaarsma & Welin, 2012) as the alternative can be counterproductive to their cause.

2.9.1. Charitable Organizations

Coinciding with the global increase in ASD prevalence over several decades has been the proliferation of organizations centered on the cause of autism in the US (Autism Society of America, 2014; Autism Speaks, 2013b), the UK (National Autistic Society, 2014; Research Autism, 2014) and in the Republic of Ireland (Irish Autism Action, 2014; Irish Society for Autism, 2014). While many organizations pursue local interests in research, public awareness, and fund raising activities (Irish Society for Autism, 2014; Research Autism, 2014) others have globalized in a manner reminiscent of international corporations. Autism societies are especially widely dispersed with interconnections of various types. For example, the Autism Society of America works on a local level through affiliated chapters in each of the fifty US states (Autism Society of America, 2014). Smaller national societies, such as the Irish Society for Autism, have a sharper local focus and maintain only informal links to international associations such as Autism Europe (Autism Society of America, 2014; Irish Society for Autism, 2014). There is little research at this time as to whether the conglomerated charity model has remained responsive to the views of the groups they serve, especially when divergent views emerge.

Despite the innumerable organizations with a mission to increase awareness, raise funds, or support research in the area of autism spectrum disorders, a limited few are becoming increasingly dominant on a global scale (Autistic Self Advocacy Network, 2014). One such charity proclaims itself as the world leader in funding ASD research and advocacy programmes (Autism Speaks, 2014a). Fundraising has highly evolved to include major international events. The ‘Light it up blue’ campaign, for example, had iconic landmarks bathed in blue light across many countries (Dillenburger et al., 2013) to express solidarity with the ASD community and raise funds for supports.

There can be no doubt that the larger autism charities are effective in raising both funding and public awareness of ASD (Autism Speaks, 2013a). Yet the more able on the autism spectrum have repeatedly criticized these efforts and the methodology employed. Most vocal in its condemnation of mainstream fundraisers has been the Autistic Self Advocacy Network (ASAN).

The ASAN website has recently drawn attention to its frustration with the language and tactics of major public awareness campaigns. The criticism, posited as a letter addressed to the sponsors, donors, and supporters, is an attempt to be heard by a key stakeholder in the autism community (Autism Self Advocacy Network, 2014). Although numerous groups have joined together to make this statement, the voice of the movement has been Ari Ne’eman, president of ASAN.

Despite the supportive role traditionally played by charitable organizations and an expressed mission to unite the autism community (Autism Speaks, 2014a), little effort has been made to include the voice of individuals with ASD within the decision-making structure of the most influential advocacy groups (Autism Self Advocacy Network, 2014). The self-advocacy movement holds the tenet ‘nothing about us, without us’ (Ne’eman, 2009) as a central pillar of autism advocacy as it has been to the disability movement for decades (Charlton, 1998).

2.10. The Public Face of Autism

Charitable organizations (Autism Speaks, 2014; National Autistic Society, 2014; Irish Autism Action, 2014) have raised public awareness of autism spectrum disorders through fundraising, advertisements, and celebrity endorsements. While the increased public recognition of the autistic condition is welcomed, these campaigns present some effects that cause concern. For those of the general public with limited exposure to individuals with ASD, these awareness efforts may not provide a full understanding of the condition or the population diagnosed with ASD.

2.10.1. The Invisible Face of Autistic Adults

Stevenson and colleagues (2011) have presented evidence of what they refer to as the infantilizing of the autism spectrum. According to their study, nine out of the twelve top income-generating autism charities use only child references on their websites. The report goes on to point out that all 8 chapters that used a photo of an adult with autism accompany it by several photos of children on the spectrum. Furthermore a full 95% of the homepages of the various state chapters of the Autism Society of America showcase only images of children. By using children to foster the imagery of innocence and hope charities appear to be playing on empathy to increase their own finances. Many people with ASD have been very vocal in denouncing the sympathy and pity approach to supporting individuals with autism (Harmon, 2004; Jordan, 2010). Despite the stance taken by self-advocating members of the population with ASD, charity organizations continue to rely exclusively on the image of a child.

ASAN has denounced the low priority placed on services and support provided to adults with ASD (Autism Self Advocacy Network, 2014). Although little research exist regarding the operational activities of these organizations, there is research showing higher rates of support group participation among parents of children with autism (Mandell & Salzer, 2007) and many of the more prominent charities for ASD have been founded by parents (Generation Rescue, 2014) of newly diagnosed children or grandparents of a newly diagnosed child with ASD in one case (Autism

Speaks, 2014c). Members of the autism community have begun to question why the organizations are disregarding the voice of its constituents (i.e. individuals with autism) in favour of appealing to the stereotype of the helpless, disabled child in need of a cure (Ne'eman, 2009).

2.10.2. Racial exclusion in ASD imagery

Individuals with autism spectrum disorders have been depicted in films, TV programmes, and novels. The overwhelming image portrayed in all formats is of a white (e.g. Caucasian) person (Heilker, 2012). Heilker (2012) noted even all the 'shiny autistics' (i.e. a term used by some activists on the spectrum to refer to those held up as heroes on the spectrum by ASD support groups) are white persons. TV reviewers writing about characters with ASD (Hill, 2013) failed to take notice of the fact that all the characters they list as autistic are also white.

Despite the fact that ASD has been reported across racial, cultural, national, and socioeconomic groupings with relatively equal distribution (Baird et al., 2006; CDC, 2012; Williams et al., 2005) the media in the form of TV, film, and print has avoided use of images of non-white people with ASD (Heilker, 2012). While Heilker (2012) based his thesis on largely anecdotal data, the claims appear to be validated by a cursory exploration of the media images for autism. This sociological observation may be explained, however, as a symptom of the larger phenomenon of media targeting the white middleclass family audience that permeates US, UK, and Irish culture. This very group (i.e. white, middleclass, and college educated parents of children on the spectrum) is more likely to become active in ASD support groups (Mandell & Salzer, 2007).

Both profiles are misrepresentations of the ASD population. Children with autism live into adulthood and old age and diagnoses are not exclusive of any racial, ethnic, or socioeconomic group (CDC, 2012). The implications of the public misrepresentation of autism as a white, middleclass disorder may result in those of

other races or socioeconomic classes disassociating themselves from a movement that does not represent them. Funding for services and research specifically for the ASD adult population may be hard to obtain if the public is misled to believe ASD is a childhood issue. While Irish schools have a predominantly white student population, it is important that teachers in Ireland are aware of the demographic spread of ASD across ethnic, racial, and socio-economic groups. ASD has been observed in all nations of the globe with very similar prevalence rates across cultures (Chung et al., 2012).

To confront similar issues in the UK, support groups campaigned for an increased focus on adults with ASD (National Autistic Society, 2008). As a result, legislation to address inclusion and services for this population was enacted soon after adults with ASD made their voices heard (Parliament of the United Kingdom, 2009), and advocates and adults with ASD remained in focus throughout the legislative process. A new campaign 'Don't Write Me Off' (National Autistic Society, 2010) with its emphasis on employment issues faced by adults with autism kept on lobbying in the UK until the publication of the new autism strategy. The strategy set out a national plan for specialized training in autism for key staff, clear assessment and diagnosis pathways, service to facilitate independent living, improved employment supports, and unemployment benefits (Parliament of the United Kingdom, 2010). The Autism Strategy was the first such document in the UK, that directly addressed the issues adults with autism sought to support independent living.

The UK government previously agreed to these services and supports when it ratified the United Nations Convention for the Rights of Persons with Disabilities (United Nations, 2009). This international agreement requires participating governments to facilitate the independent living, productive employment, as well as social, cultural, and political inclusion (United Nations, 2006). Having committed to accommodate these human rights the UK government was persuaded to act on this pledge. Despite the passage of legislation a further campaign was instigated to protest the unavailability of the promised services to those who need them (National Autistic Society, 2013). The 'Push for Action' campaign is gathering electronic signatures to

petition the UK government to roll out the services promised in the Autism Strategy (Parliament of the United Kingdom, 2010).

These examples of activism by UK adults with autism and support organization for ASD demonstrate the powerful impact of collaborative action by the ASD community. The direct effect of the autism advocacy has not been as obvious in either the US or Ireland, two countries that have signed but not ratified the UN convention protecting the rights of people with ASD and other disabilities (United Nations, 2009).

Human rights and entitlement to support services for individuals on the autistic spectrum have not been on the public agenda in the US as it has been in the UK (National Autistic Society, 2010). The legislation and accompanying Autism Strategy (Parliament of the United Kingdom, 2010) have put in place many of the scaffolding services such as job seeker allowances for job training programmes and ASD-specific training to allow job centre staff to make appropriate accommodations at work sites for people with autism (Parliament of the United Kingdom, 2010) as called for by advocates (Autistic Self Advocacy Network, 2014) and support agencies (Autism Society of America, 2014) in the US. This accomplishment, however, required a cooperative effort and mutual planning to garner the support in the Parliament (National Autistic Society, 2008).

2.11. Celebrity and autism as a cause

Efforts by autism charities to raise public awareness of ASD have been widely evident across the globe. In recent years, global celebrations of April as World Autism Awareness Month have been on the increase (Dillenburger et al., 2013). Campaigns such as Light it up Blue by Autism Speaks have had an international appeal (Autism Speaks, 2014b). Autism charities have celebrity supporters in the US (Huffington Post, 2014) but not so much in Ireland (Irish Independent, 2014). While increased public awareness of ASD has been achieved in some places, e.g., 82% of

the general public were reportedly aware of ASD in a general population survey in Northern Ireland (Dillenburger et al., 2013), a deeper knowledge of the impact of autism on individuals and an active advocacy for people on the spectrum has not necessarily followed from awareness campaigns.

In fact, negative consequences can come from Hollywood celebrities presenting themselves as autism experts. A significant example of this can be seen in the autism-vaccine debate. The MMR vaccine had been reportedly linked to autism (Wakefield et al., 1998). The scientific community continually refuted Wakefield's findings by showing a negative correlation between thimerosal-containing vaccines and the rise in ASD prevalence (Hviid, Stellfeld, Wohlfahrt, & Melbye, 2003; Madsen et al., 2003; Taylor, 2006). Finally, after an extensive investigation lasting over a decade, Wakefield's research was found to be fraudulent and he was struck off the UK medical register (Godlee et al., 2011). Some autism advocates in the US, UK, and Ireland continued promote the discredited claims of causal link between MMR vaccine and autism (Wakefield et al., 1998) despite increasing evidence to the contrary (Gross, 2009).

Gross (2009) aptly sites the 'vaccines cause autism' belief as an example of an evidence-resistant theory and a British poll reported that more than 25% of respondents believed that the link between vaccines and autism was proven (Hargreaves, Lewis, & Speers, 2003). Conspiracy theory also played a role in this controversy (Gross, 2009), as the pharmaceutical companies, US Center for Disease Control, and other government agencies were accused of covering up the evidence that would prove the vaccine link to the rise in ASD (Parents Requesting Open Vaccine Education, 2008).

The connection between autism and childhood vaccines continues to be debated in the mass media and on the World Wide Web garnering attention and funding from new research and provision of services for those with ASD (Gross, 2009). Scientific evidence has been ignored in favour of misinformation presented by celebrities (Gross, 2009; Heilker, 2012). Alongside Robert F. Kennedy Jr., nephew of President John F. Kennedy, and actor Jim Carrey, the American actress Jenny McCarthy has been the public face of the continuing autism-vaccine controversy (Specter, 2013).

Individual autism charities and their celebrity representatives have continued to make an argument for a causal link between childhood vaccines and autism spectrum disorders (Generation Rescue, 2014; Gross, 2009). Continued faith in Dr. Wakefield's (1998) research even after its retraction by the Lancet (Godlee et al., 2011) and in the face of the accumulation of scientific evidence that refutes the original results (Hviid et al., 2003; Madsen et al., 2003) has been displayed on worldwide popular media (i.e. websites, blogs, TV talk shows, and advertising campaigns; Parikh, 2011). There is value added to these messages due in large part to the pop culture celebrity-status of the messengers.

Celebrity endorsement for fundraising organizations is more obvious and efficacious in some of the mainstream US autism charities (Generation Rescue, 2014). In some instances the celebrity leadership of the organization takes center stage in webpages, media reports, and fundraising events while the beneficiaries of the effort (e.g. adults and children with ASD and their families) are relegated to the background (Heilker, 2012; Stevenson et al., 2011).

With Hollywood stars as competition, scientists have found it difficult to get the evidence into the focus of public attention (Gross, 2009). According to Gross (2009), what is left is a void of sound empirical reasoning allowing misinformation to flourish. The so-called 'debate' continues in part due to the failure of the scientific community to effectively present the evidence directly through common mass media as well as the insistence by journalistic sources to treat the issue as a two-sided debate (Gross, 2009). Media commonly argue for presenting both sides of a political debate in the interest of balanced reporting. In the case of autism, this insistence has stacked good science (i.e. evidence refuting the autism-vaccine link) against celebrity and anecdotal evidence of some headline grabbing personal stories of parents of children with ASD (Watkins, 2012).

2.12. Autistic Culture as Counterculture

The autism community not only includes the parent advocates and charity agencies but also individuals with ASD who advocate for themselves and others on the spectrum. Many individuals with autism speak out against the limits placed on those with disabilities. The activists in the autism community have modeled their movement on the disability rights movement, deaf rights movement, as well as the gay and lesbian rights activists. The voices of individuals with autism are growing with new vehicles from which to advocate.

2.12.1. Neurodiversity

Neurodiversity, a sort of shorthand for neurological difference, is both a sociological concept and a human rights movement. As a sociological concept (Armstrong, 2012; Pollak, 2009) it is akin to biodiversity, a term that encompasses the wide variety of life forms inhabiting an environment. Neurodiversity is also a part of the more general move towards embracing diversity by expanding this notion beyond observable human characteristics (e.g. race, gender, or sexual orientation) and including the neurology of individuals (Baker, 2011). The term is increasingly becoming a more comprehensive terminology to indicate inclusiveness in communities and schools (Armstrong, 2012; Pollak, 2009). The adoption of this nomenclature seems to be expanding globally (Chamak, 2008; Holt-Damant, Guaralda, Taylor Gomez, & Nicollet, 2013; Pollak, 2009).

Neurodiversity may be becoming part of the professional and popular jargon to express a greater degree of inclusivity in society, but the meaning of the term is yet to be clarified. Mackenzie and Watt (2011) draw attention to the similarity between the diagnoses that have been grouped as neurodevelopmental disorders (American Psychiatric Association, 2013) and those accepted as part of the alternative disability community. Individuals with ASD, ADHD, Tourette's, bipolar disorder, dyslexia, dyspraxia, oppositional defiant disorder and epilepsy are included both as neurodevelopmental disordered and neurodiverse, although the latter is more

malleable and open to interpretation (Mackenzie & Watts, 2011). It is, however, the autism community that has largely made this concept its own, i.e., some autism self-advocates have adopted the term, and this has brought it into the public discourse (Jaarsma & Welin, 2012).

Neurodiversity proponents have developed distinct terminology identifying those in society that are not affected by neurological disorders. The term ‘neurotypical’ (NT) has come to represent those who are not on the autistic spectrum and as such are viewed as functioning in society as the typical majority (Sinclair, 1998).

Neurotypical has become widely used to in research studies to differentiate individuals who are not on the spectrum from those who are autistic (Constantino, Zhang, Frazier, Abbacchi, & Law, 2010; Senju, Southgate, White, & Frith, 2009). However, the neurodiversity movement has not embraced the neurological diversity of individuals who are not on the autism spectrum. It could be argued that neurotypical ‘normality’ does not exist, but that different levels of service need or ability to live independently should be the distinctive factors between individuals in need of support and those who do not need support. The DSM5 (2013) includes 3 levels of support needs under the diagnosis of ASD, and as such, individuals who do not have support needs would no longer fit the diagnosis.

2.12.2. Cure and Treatment

As a human rights or disability movement, the neurodiversity movement can be considered a way of changing the view of neurodevelopmental disorders as diseases in need of treatment or cure (Jaarsma & Welin, 2012; Ortega & Choudhury, 2011). Traditionally, ASD has been viewed within a medical model, as a biological disorder in need of treatment and cure (if one becomes available) in the same vein as small pox or polio. The medical model, i.e. viewing ASD as a disease existing within the individual, seeks to treat the patient with ASD as well as prevent its occurrence in future generations (Ortega & Choudhury, 2011). This contrasts with the social model of ASD espoused to by the neurodiversity movement. ASD, according to this view, is a natural variation of human existence requiring environmental and societal

adaptations to accommodate these differences (Jaarsma & Welin, 2012; Sinclair, 1993). Some adults with ASD object to the rhetoric of treatment and cure because and view this approach as an assault on their very existence (Autistic Self Advocacy Network, 2014; Harmon, 2004). For example, the so called ‘ransom’ campaign to raise public awareness of ASD used billboard advertising with language simulating a kidnapper’s ransom note to a family of the child recently ‘taken’ by autism (Kras, 2010). Public opinion, as well as the voice of people on the autism spectrum, expressed concern over the comparison of the criminal acts of a kidnapper with the diagnosis of an autism spectrum disorder (Kaufman, 2007; Kras, 2010; Stop.Think. Autism, 2007).

Although some examples of language used by autism campaigns could well be viewed as inflammatory and degrading to people living on the spectrum (Kras, 2010), it is the call for autism cure and recovery that separate the neurodiversity advocates from those promising recovery (Kapp, Gillespie-Lynch, Sherman, & Hutman, 2013).

Along with denunciation of the search for a cure for autism, autism self-advocates have also objected to interventions that target diagnostic features of ASD (Kapp et al., 2013; Ortega & Choudhury, 2011). Some of the self-advocates focus specifically on interventions based on applied behaviour analysis (Dawson, 2009; Ortega & Choudhury, 2011). Dawson (2009) for example, contends that applying ABA-based programmes to individuals without their expressed consent is unethical and contends that parental consent is insufficient to legitimize the implementation of ABA programmes for young children. Dawson’s (2009) very strongly held views are in stark contrast to, and ignorance of, the very strict ethical guidelines laid out by the Behaviour Analyst Certification Board (BACB, 2014).

Learning new socially acceptable skills, new behaviours, and knowledge is the core function of formal schooling. Societies have made education compulsory even in cases where individuals have not consented. In general, behavioural change efforts

have not been seen as unethical in modern societies and ABA-based interventions have been recommended by the US government (US Surgeon General, 1999). Dawson's (2009) generalizations about behavioural interventions, behaviourists, and parents who employ ABA-based interventions are provocative in the same way as the rhetoric of some autism organizations (e.g. Cure Autism Now, Generation Rescue) denounced by autistic self-advocates (Kras, 2010).

2.12.3. Autistics, Aspies, and culture

An initial note regarding language and labels is required. In a milieu often referred to as 'geek chic' (Heilker, 2012), individuals on the spectrum often refer to themselves as autistics, autists, and Aspies (e.g. someone diagnosed with Asperger's). The use of these identifiers conflict with the philosophy of person first language (i.e. identifying the person before the disability to give prominence to the person rather than the condition; Blaska, 1993). Many self-advocates have taken a position of self-determination (i.e. the adoption of labels of disorder as badges of pride) and as such, have re-appropriated the label (Jordan, 2010). In doing so autistics have followed in the footsteps of their predecessors in *Mad Pride* (Curtis, Dellar, Leslie, & Watson, 2001) and *Queer Nation* (Slagle, 1995).

Donna Williams, an autobiographer and speaker on autism issues, has been promoted as an example of person before diagnostic label identification (i.e. a person with autism; Ne'eman, 2009; Williams, 1994). Williams (1994) describes herself as a person affected by autism and has used behavioural interventions to allow the real person on the inside to come through. On the other hand, Temple Grandin, a professor of agriculture, author, and autism expert, has been outspoken in her view that autism makes her who she is and she would not wish for a cure (Grandin, 2006). Professor Grandin refers to herself as an autistic and uses the language of the neurodiversity movement. Although Grandin has embraced her autistic traits she was the recipient of behavioural interventions and intensive teaching by her mother (Cutler, 2004). The nuance of language used as identity is emblematic of the cure-centered debate (Heilker, 2012; Jaarsma & Welin, 2012; Sinclair, 1998).

For individuals with ASD, the Internet with its webpages, blogs, and social media sites have proven substantive resources for self-expression, group formation, and information sharing (Jordan, 2010). For some, the social-communicative difficulties experienced by many individuals with ASD have been circumvented through an electronic interface. The ability to focus on the message rather than the messenger, the nuance of social interaction, and a mutual environment is eliminated in a virtual forum. The exchange of ideas, thoughts, and opinions on the Internet have taken socialization and made it autism-friendly for a large segment of the population with ASD. Nearly two decades ago Harvey Blume (1997) declared it was the Internet that had brought the autistic community to fruition and maturity.

The position taken by many within the autism self-advocacy community denouncing the search for a cure for autism is the most controversial issue (Jaarsma et al., 2012). In perhaps an oversimplification of the case for neurodiversity, Ne'eman (2009) has equated the quest for a cure for autism with an attempt to cure humans of femaleness or left-handedness. He further argues that the classification of ASD as a disease by the American Psychological Society in DSM5 (American Psychiatric Association, 2013) is as ill advised as its previous classification of homosexuality in a similar vein (Ne'eman, 2009). The neurodiversity movement claims to advocate on behalf of those with autism and attention deficit, hyperactivity disorder (ADHD), dyslexia, dyspraxia, and bipolar disorder among other neurodevelopmental disorders, yet membership of the community has not been clarified.

The discussion of neurodiversity with regard to the population with ASD should be tempered with the caveat that this social construct is still in its formative stages as its proponents have yet to work out the extent of inclusiveness of this concept (Jaarsma & Welin, 2012). Jaarsma and Welin (2012) argue for an exclusive definition of neurodiversity, one that includes those who have the ability to self-advocate and achieve high levels of independence while leaving out the individuals with severe ASD. The neurodiversity movement refusal of treatments to ameliorate ASD

characteristics, would not apply to those with severe disabilities as proposed by some in the movement who suggest that parents are violating the rights of their children by using ABA-based interventions (Dawson, 2009).

Some proponents within the neurodiversity movement have failed to recognize the impact of the different abilities and vulnerabilities across the spectrum. The hardliners who have demonized educational and behavioural interventions (Dawson, 2009; Ne'eman, 2009) are counterproductive to the very self-advocacy the neurodiversity movement promotes (Jaarsma & Welin, 2012). The interventions in question, applied behavioural analysis in particular (Dawson, 2009), have been effective means for teaching new communicative and social skills (Dawson et al., 2010; Healy & Lydon, 2013) necessary for some autistic individuals to develop self-advocacy skills. Those without the capabilities to express their opinions, communicate their needs, or attend to information pertinent to their well being need effective interventions to move toward independence and self-advocacy (Baker, 2011; Stagliano, 2010).

The founder of ASAN and arguably one of the most visible proponent of neurodiversity, Ari Ne'eman, had received a Presidential nomination to the National Council on Disability (NCD) in 2010 (Harmon, 2010). Although his appointment was approved, the process was delayed in the US Senate as a public debate ensued centering on the issue of advocacy for those with greater impairments on the spectrum (Stagliano, 2010). While Mr. Ne'eman's eventual appointment to the NCD can be viewed as a victory for inclusion of those with ASD in a position that help form public policy, there has been some fallout as well. The appointment raised questions whether someone affirming the neurodiversity view of ASD can be a representative voice of those on the spectrum with intensive needs (Harmon, 2010; Stagliano, 2010). Ne'eman's nomination was eventually carried through the US Senate unanimously and without debate and without any indication why or who instigated the six-month delay (Diamant, 2010).

While science has searched for the causes of autism (Herbert, 2005; Norris, 2006) with limited success, current diagnosis of the disorder is left to a list of behavioural observations (American Psychiatric Association, 2013) indicative of those with the syndrome. These behavioural excesses and deficits are measured using assessment instruments (Mesibov, Schopler, Schaffer, & Michal, 1989) with varying degrees of reliability (Rellini, Tortolani, Trillo, Carbone, & Montecchi, 2004). The diagnostic instruments used to indicate the presence of an autism spectrum disorder are subjective measures and do not indicate the absolute presence of a genetic anomaly (Stratheam, 2009). In the efforts to ameliorate the effects of ASD behavioural interventions seek methods to address the deficit and excess behaviours that prohibit individuals from inclusion in education, social groups, family life, and employment (Cooper, Heron, & Heward, 2007).

Until recently the self-advocate John Elder Robison served on the advisory board of Autism Speaks as its only high ranking official with an ASD (Robison, 2013). Robison's view on autism interventions has been a more moderate than Ne'eman's. Embracing his individuality and the effect autism has in developing his identity (e.g. narrow, restricted interest in electronics), Robison does not desire to lose his autism. His views are more moderate than those expressed by others in the neurodiversity movement in that he realizes others with ASD and their carers may seek interventions (e.g. medical, educational, and behavioural treatments) to ameliorate the realities of autism in their lives (Stagliano, 2010). Prior to ending his affiliation with Autism Speaks Mr. Robison was criticized for his complicity with an organization seeking to treat autism through medical and behavioural interventions (Brown, 2013; Willingham, 2013).

The concepts requisite for a definition of culture (Oxford Dictionary, 2005): a shared identity in the diagnoses on the autism spectrum to differentiate the social group, shared beliefs are evident in the advocacy for disability rights and self-determination and there is also a shared language (e.g. neuro/NT is a neurotypical person or non-autistic, aspie is a person with Asperger's syndrome) to further solidify the community element. However, the characteristics of the cultural social group,

defined by the characteristics of those who participate in the culture, have yet to be determined for the neurodiversity movement (Harmon, 2010; Jaarsma & Welin, 2012).

2.12.4. Conclusion

The culture of autism has developed to the extent that the more people with ASD are making their opinions heard, changing public perceptions, and taking up positions of political power and influence (Jaarsma & Welin, 2012; Willingham, 2013).

Ultimately, much of the success enjoyed by the individuals on the autism spectrum as well as by organizations both in the mainstream culture and autistic culture has been enhanced by the increased participation and greater level of engagement, much of it due to technology developed in recent year (e.g. internet accessibility, blogs, chat rooms, touchscreen technology, mobile phones with computer hardware and social media) and their unique suitability (e. g. require less direct social interaction, adaptable to alternative communication methods, can be used in environmental setting of users choice) for the autistic population (Jordan, 2010).

Not only have ASD charity organizations benefited from reaching large numbers of the general population by sharing information and personal stories online, but they have also benefitted in terms of revenue collected by electronics means (Autism Society of America, 2014; Autism Speaks, 2014a; National Autistic Society, 2014). At the same time, the rapid development of social media has benefitted the alternative autism culture as well (Autistic Self Advocacy Network, 2014).

The appeal to embrace neurodiversity, as an all inclusive advocacy social agent (Blume, 1997), has perhaps been premature. Until this movement can account for the needs of the most vulnerable (e.g. individuals who experience severe impairments) while advocating, for the rights of those with much greater abilities there will be controversy. The neurodiversity movement advocate social acceptance and inclusion of those with neurological disorders (Brown, 2013; Ne'eman, 2009) yet some would

create division in the population with neurological disorders based on ability (Jaarsma & Welin, 2012) as a means of greater social acceptability of the cause.

The rift this issue has caused in the autistic culture can be seen in both the opposition to Ne'eman's appointment to the NCD (Stagliano, 2010) and the opposition faced by Robison in his role on the advisory board of Autism Speaks (Brown, 2013). Public infighting within the ASD community may contribute to frustration and withdrawal of popular support (Harmon, 2010). On the other hand, finding common ground between self-advocates and those who advocate for better interventions has the potential to bring about real social change (i.e. 'I exist' Campaign; National Autistic Society, 2008).

3. Applied Behaviour Analysis

3.1. Introduction

Based on earlier definitions by Baer, Wolff and Risley (1968), today applied behaviour analysis (ABA) is defined as follows:

‘Applied behavior analysis is the science in which procedures derived from the principles of behavior are systematically applied to improve socially significant behavior to a meaningful degree and to demonstrate experimentally that the procedures employed were responsible for the improvement in behavior.’

(Cooper et al., 2007)

Methods and techniques derived from the science of applied behaviour analysis have been used successfully to address inappropriate behaviours in the classroom (Herscovitch, Roscoe, Libby, Bourret, & Ahearn, 2009; Maag & Larson, 2004). They are also used to teach new skills to make disruptive behaviours functionally obsolete and to improve academic attainment (Barnhill, 2005; Grey, Honan, McClean, & Daly, 2005; Ingram, Lewis-Palmer, & Sugai, 2005).

The experimental analysis of behaviour has a long history, starting with pioneering work by Thorndike (Chance, 1999) and Watson and Pavlov’s work on respondent conditioning, i.e., exploring behaviours that are the result of the presentation of a variety of stimuli and are largely involuntary. This early work was built upon by Skinner’s discoveries of operant behaviours, focusing on the effect of consequences on responses that are generally voluntary and/or spontaneous (Alberto & Troutman, 2009).

These pioneers expanded the boundaries of behaviourism. They rejected the prevailing mentalistic approach of mainstream psychology that maintains that most behaviour is caused by an inner state (Dixon, Vogel, & Tarbox, 2012). Skinner adopted ‘radical’ behaviourism (from the Greek [rædɪk³l] adj. ‘arising from or going

to a root or source; basic' to behaviour). By categorizing thoughts and feelings as inner/private behaviour bound by the same principles as publicly observable behaviour, radical behaviourism offers a holistic, i.e., non-dualistic approach (J. O. Cooper et al., 2007).

The application of behavioural theory to socially significant behaviours, i.e., applied behaviour analysis is a thriving discipline with dedicated journals (Journal of Applied Behavior Analysis; Behavior Analysis in Practice), large membership associations (Association for Behavior Analysis-International, ABAI; European Association for Behaviour Analysis, EABA; Association of Professional Behavior Analysts, APBA), and professional certification (Behavior Analyst Certification Board, BACB; J. O. Cooper et al., 2007; Dixon et al., 2012). Increasingly, behaviour analysis is recognized as a licensed profession (e.g., Massachusetts Licensure; Massachusetts Department of Education, 2011).

As outlined above, ABA utilizes experimental analysis of behaviour, i.e., knowledge gained in the laboratory and applies this to clinical processes in the community to serve a large and diverse population. Behaviour analytic interventions are evaluated through rigorous scientific procedures to individuals and groups in community settings (Dillenburger & Keenan, 2009). For example, challenging operant behaviours, those learned and shaped by environmental antecedents and consequences, are one of the areas frequently addressed by applied behavioural analysts. In any case, for behaviour analysts the target behaviour must hold social significance; this concept is assessed through social validity outcomes, a cornerstone of ABA-based intervention measures (Baer et al., 1968).

Despite accessible definitions of the science of behaviour analysis (Alberto & Troutman, 2009; Cooper et al., 2007; Vargas, 2013) there is often confusion in the public perception of what constitutes ABA. The Report of the Task Force on Autism (2001) offers a clear example of misrepresentation of ABA when it refers to table top drills and compliance training that characterizing the 'pure' approach to ABA (p.

104). This account is not only limited in its depiction of the range of techniques, it is provocative in its implication to distort the actual goals of ABA. Another common misrepresentation is the reference to the Lovaas approach as synonymous with ABA (Cumine, Leach, & Stevenson, 2000; Jones, 2002) while failing to reference the underlying science or describe the other techniques derived from the science of behavioural analysis (Dillenburger & Keenan, 2009).

There is an increasing acceptance of ABA as a science with advantageous results for groups requiring improved learning outcomes. The Surgeon General of the United States of America recommends ABA-based interventions referring to the large body of research evidence of efficacy for students on the autistic spectrum (US Surgeon General, 1999). This report cites the successes of ABA in ‘reducing inappropriate behavior and in increasing communication, learning, and appropriate social behavior’ (US Surgeon General, 1999). This official recognition of ABA-based interventions points directly to its multi-faceted approach to deal with inappropriate behaviours as well as to build new and appropriate skills repertoires.

The use of behavioural approaches to improve behaviour deemed problematic in schools was highlighted by the amendment to the Individuals with Disabilities Education Act of 1997 (United States Congress, 1997). It compels those developing programmes:

In the case of a child whose behavior impedes his or her learning or that of others, [to] consider, when appropriate, strategies, including positive behavioral interventions, strategies, and supports to address that behaviour

(IDEA, Sect.614 (d)(3)(B)(i))

This legislation also requires the completion of a functional behavioural assessment (FBA) and implementation of a behavioural intervention plan based on FBA for students with special educational needs and challenging behaviours (United States Congress, 1997).

These endorsements of ABA and FBA, a crucial element of the behavioural approach, are a significant step in the recognition of the efficacy of these procedures for use with a wider group of students (Gable & Hendrickson, 2000; Gresham, Watson, & Skinner, 2001; Mitchell, 2008).

In contrast, in the UK, erroneous reports (e.g. Task Group on Autism, 2002) have shaped recent public perception and pigeonholed ABA as one specific treatment approach for ASD (Dillenburger & Keenan, 2009). From its inception ABA provided the tools for behaviour change across a wide and diverse range of human behaviours, for example, seat belt use, littering, sports, language acquisition, health, and exercise (Cooper et al., 2007).

In addition to ASD, additional pertinent empirical research has been reported on challenging behaviour in other populations with special educational needs. To illustrate, ample research has determined the efficacy of ABA and FBA for individuals diagnosed with emotional behavioural difficulties (EBD) or at risk of developing EBD (Maag & Larson, 2004; Newcomer & Lewis, 2004; Sasso, Conroy, Stichter, & Fox, 2001). Many studies support ABA technology and show positive results for those treated with interventions based on a functional analysis. Issues that require further exploration include validity (Gresham, 2003), willingness of school staff to perform such assessments (Westling, 2010), and confusion about the exact contents of a functional behavioural assessment/analysis (Kern, Hilt, & Gresham, 2004; Sutherland, Lewis-Palmer, Stichter, & Morgan, 2008; Weber, Killu, Derby, & Barretto, 2005).

3.2. Functional Assessment and Analysis

After initially ruling out significant health issues in the presence of enduring challenging behaviour (Clements, 2005; Emerson, 2001) a functional assessment is requisite. The knowledge gained through this process increases the likelihood of successfully replacing or reducing the target behaviour (Ingram et al., 2005). Functional

analysis and functional assessment are both used to identify the environmental factors which influence the target behaviour (Dixon et al., 2012). However, functional assessment and functional analysis differ in that the former uses descriptive methods (e.g. record reviews) and observation to formulate a hypothesis of function while the latter establishes a causal relationship between the dependent and independent variables through experimental procedures (Dillenburger, 2000).

While each individual and the behaviour they exhibit are unique and require assessment to determine behavioural function (Dixon et al., 2012) decades of research has determined a number of experimental conditions necessary to ascertain the function of challenging behaviour (Gresham et al., 2001; Matson & Minshawi, 2007). The seminal study by Iwata and associates (1982) has provided a starting point and a template for conducting functional analysis of self-injurious behaviour (SIB).

These researchers used scientific experimental design with a control condition (i.e. play) with which to compare each test condition (Dixon et al., 2012). The experimental conditions were (1) social disapproval or reprimands (2) academic demand (3) alone and (4) unstructured play (Iwata et al., 1982). During the social disapproval phase the researcher attends to another activity (e.g. reading papers) and only interacts with the subject by giving a reprimand (e.g. 'Don't do that, that's not nice!') following the occurrence of the target behaviour. The academic demand phase involves presenting the student with a novel but ability-appropriate educational task (e.g. tabletop picture matching) for completion while being prompted and praised by the experimenter. Additionally, during this phase inappropriate behaviours are ignored. The alone condition requires that the student is left in a room on his/ her own without toys or other materials. The unstructured play phase consists of the student in close proximity to the researcher who responds with praise and social interaction in the absence of the target behaviour (e.g. student is praised for intervals with appropriate behavior and researcher responds favourably to attempted social interaction). Inappropriate behaviours are ignored during this experimental phase.

The first three phases represent the three possible functions of the behaviour: positive reinforcement, negative reinforcement, and self-stimulatory reinforcement respectively (Iwata et al., 1982). Although these experimental conditions have been modified through subsequent research to (1) attention (2) escape/ demand (3) alone and (4) a control condition, the procedures detailed by Iwata and colleagues (1982) have been adopted with little variation in the decades that followed their pivotal work (Dixon et al., 2012).

3.3. Increasing Behaviours

A determination of environmental antecedents and consequences of behaviour is the key for a clear understanding of maintaining variables (Emerson, 2001). Behaviours are maintained by reinforcers. A reinforcer is any consequence that follows a behaviour and increases the likelihood that the behaviour will be performed in the future (Foxx, 1982a). As such, reinforcement is defined as the functional relationship between a consequence and the probability of future behaviours (Alberto & Troutman, 2009). Two types of reinforcement are distinguished, positive and negative reinforcement. Positive reinforcement refers to the addition of a stimulus while negative reinforcement indicates that a stimulus (e.g. a demanding task) is withdrawn and reoccurrence of the behaviour in the future is increased (Donnellan, LaVigna, Negri-Shoultz, & Fassbender, 1988).

A common example used to illustrate these behavioural phenomena is the everyday occurrence of a telephone call. The telephone, a stimulus, is neutral in that it does not elicit behaviour on its own (e.g. we do not usually pick up a phone just because it is in the same room as we are). However, when the ringing of the phone occurs and has become a conditioned stimulus through training, we are likely to answer it to find out who is calling (conditioned response). If we answer the call to find a good friend on the other end we are likely to continue our answering behaviour each time the phone rings to talk with other friends (positive reinforcement). However, if we have been falling behind on our loan payments and are expecting bill collectors to contact us, the phone ringing may be muted to avoid the unpleasant tone of the collection call

(negative reinforcement). Under similar circumstances we may repeatedly avoid answering the phone.

Positive reinforcement, the addition of a stimulus, and negative reinforcement, the removal of a stimulus, both result in the increased probability of the target behaviour occurring in the future (Cooper et al., 2007). Different processes can result in the decreased occurrence of a behaviour.

3.4. Behaviour Reduction Techniques

When defined behaviourally, punishment occurs if the consequence of a behaviour reduces the future probability of the behaviour recurring in a similar situation (Emerson, 2001). As with reinforcement, there are negative and positive punishment operations which refer to the addition of a stimulus (positive) and the withdrawal of a stimulus (negative; Donnellan et al., 1988). While this functional definition does not limit positive punishment to the application of aversives, there are a range of problems with the administration of positive punishment procedures including:

- They do not increase adaptive behaviours (Clements & Zarkowska, 2000).
- They can produce aggressive responses (Donnellan et al., 1988; Foxx, 1982b).
- The procedures are often socially unacceptable in community settings (Emerson, 2001).
- There is a historic overreliance on aversives in society as a whole (Sidman, 1989).
- Application of punishment procedures can negatively reinforce the use of punishment, i.e., lead to an increase in the use of these procedures by the administrator (Clements & Zarkowska, 2000; Emerson, 2001; Maag, 2001).

There are alternative methods to reduce problem behaviours that avoid some or all of the pitfalls outlined above. Differential reinforcement of other (DRO), alternative (DRA) and incompatible (DRI) behaviours are possible intervention techniques used to eliminate problematic behaviours (Emerson, 2001). A DRO procedure reinforces behaviours other than the targeted behaviour (Donnellan et al., 1988). For example if an individual with an ASD hits others to gain attention from staff, a DRO programme would reinforce any behaviour, other than hitting, with attention, e.g., seeking attention verbally, through the use of a communication device or by using a tap on the shoulder.

There are a variety of procedures that can be used to reduce individual target behaviour and situation. For example, a fixed interval (FI) schedule of differential reinforcement of other (DRO) may be set up where reinforcers are delivered after a set time interval for any other behaviour, providing the target behaviour has not been observed (Foxy, 1982a). The interval can be extended gradually. The FI contrasts with the variable interval (VI) schedule in which reinforcer delivery is scheduled after a time lapse without the occurrence of the target behaviour with the time varied around a specified average, for example a VI5 schedule means that any other behaviour in absence of unwanted behaviour is reinforced at different intervals that average 5 seconds (Donnellan et al., 1988).

A drawback for the DRO procedure, if not carefully planned and implemented, is the potential inadvertent reinforcement of a behaviour that is similar in practice or function to the targeted behaviour (Cooper et al., 2007). The DRO procedure may seek to reinforce behaviours other than calling out to elicit teacher attention, but in real life situations, the appropriate behaviour, hand raising, for example, may be accompanied by inappropriate noise-making. Reinforcing the hand raising, an appropriate behaviour, may incidentally reinforce the noise-making due to temporal proximity of the two behaviours.

Differential reinforcement of incompatible behaviour (DRI) is another useful procedure in reducing target behaviours (Alberto & Troutman, 2009). The reinforcer in a DRI programme is given when the individual performs a specified task that is chosen because it is impossible to perform it and the target behaviour simultaneously (Foxy, 1982b), e.g. with out-of-seat behaviour as the targeted behaviour for reduction, reinforcement of sitting at the desk may be applied in a DRI as it is impossible to be in your seat and be out of it at the same time. However, it must be noted that new skills may need to be taught first to ensure that the incompatible behaviour is in the student's behavioural repertoire (Clements & Zarkowska, 2000).

Building new skills is advocated by many researchers as a proactive, socially acceptable, and efficacious approach to addressing challenging behaviour (Donnellan et al., 1988; Emerson, 2001). With the information about the function of the target behaviour as a result of the functional behavioural assessment, appropriate alternative behaviours which serve the same function can be taught to replace challenging behaviours (Emerson, 2001). Alternative behaviours that are easier to use and equally effective will replace inappropriate in the future if reinforced appropriately (Clements, 2005).

3.5. ABA-based Educational Intervention for ASD

The history of ABA, as the implementation of the science of behaviour analysis in real life settings to enhance socially relevant behaviours, has been documented through-peer reviewed journals (e.g. Journal of Applied Behavior Analysis) and other scholarly works (Dixon et al., 2012; Grant & Evans, 1994). As a product of the early experimental work of behaviour analysts such as B. F. Skinner (1938), applied behaviour analysis grew from a rich history of experimental research (Cooper et al., 2007). It is in recent years, however, that ABA has become a prominent focal point of a sociological and educational debate with regard to applications to ASD (Shyman, 2012).

Rising rates of ASD have thrust the issue of effective education for these students to the fore in many global jurisdictions (National Research Council, 2001; Task Group on Autism, 2002; The Task Force on Autism, 2001). The behaviour analytic literature has been clear since its inception that ABA is the application of the science of behaviour analysis (Cooper et al., 2007) and as such the most effective basis for developing scientific methods of changing behaviours that are socially relevant, i.e. behaviours that prevent individuals from being included fully in society (Kerr, Mulhern, & McDowell, 2000). While this science predates Skinner (1938) and Kanner (1944), it has been confused by many as a method of teaching those with ASD rather than the application of scientific principles of behaviour that affect all learners (Dillenburger & Keenan, 2009).

The problem that lies at the root of this mis-categorization of ABA is that it is wrongly viewed as one intervention method for ASD. In fact, this is a characteristic category mistake (Dillenburger, 2011), when an overarching category is viewed as part of a lower level category. In this case ABA (the overarching category) is set side-by-side with specific procedures that are based in ABA, such as PECS or DTT. This kind of mis-categorization of ABA has become the foundation of the autism intervention ‘wars’ (Maurice, 2003).

3.5.1. Brief History of ABA interventions in ASD

Behavioural principles have been explored with animals in the laboratory since the late 19th and early 20th century before being applied to human behaviour (Dixon et al., 2012). Many early behavioural interventions were applied to research subjects who were under state care due to a diagnosis of mental illness or intellectual disabilities. Fuller’s (1949) work is widely regarded as the first deliberate application of behavioural principles to humans. He used positive reinforcement (e.g. a sweetened milk solution) to increase the right arm movements of a previously non-responsive patient. Ayllon and Michael (1959) taught staff nurses to use reinforcement techniques to improve appropriate behaviours in patients in a psychiatric hospital and reported the impressive results. Some research during this

early period was also concerned with the population diagnosed with autism, for example Ferster and DeMyer (1961), who used an automated sweet dispenser to reinforce the lever pressing behaviour of two subjects with autism.

Although predated by this earlier research, Lovaas et al. (1987) received most of the attention for their application of one specific behaviour analysis-based method, i.e., Discrete Trail Teaching (DTT), to young people with ASD. The study showed the effectiveness of early intensive behavioural intervention, primarily based on DTT, with young children on the autism spectrum. A follow-up report (McEachin, Smith, & Lovaas, 1993) indicated the long-term maintenance of the gains when these children were teenagers and adults. For many not familiar with behaviour analysis, Lovaas' name became synonymous with ABA interventions for ASD (Jordan, Jones, & Murray, 1998).

Lovaas and colleagues' studies (1987/ 1993) have often been misinterpreted as an evaluation of a complete intervention system designed for application for those with ASD (Jones, 2002) with little or no recognition of its basis in applied behaviour analysis. This kind of misinformation has led to a public perception that Lovaas Therapy or Lovaas Programme is the same as ABA (Dillenburger & Keenan, 2009).

ABA based procedures have been developed for many other populations. For example, Iwata and colleagues (1982) conducted functional analysis on self-injurious behaviours of participants with intellectual disabilities (ID), while Carr and Durand (1985) reinforced appropriate communication skills to reduce challenging behaviours of a group of students with ID in a school setting. In the past many studies that identify participants as having intellectual disabilities, include individuals with ASD among the subjects (Matson, Bamburg, Cherry, & Paclawskyj, 1999).

Because of the recent increased focus on ASD, and in order to make replication studies possible, more detailed descriptions of participants with ASD have been

introduced. Currently, research reports typically include information regarding ASD diagnostic criteria used, subgroup membership and functional abilities (e.g. IQ level, adaptive behavior scores, receptive/ expressive language; O'Reilly et al., 2010).

3.5.2. Home-based ABA and Parent Advocacy

In the early days most applications of ABA with people with autism was conducted through home-based programmes with parents as active partners (Keenan, Kerr, & Dillenburger, 2000). In the absence of state recognition of the benefits of behavioural interventions, home-based ABA programmes are still predominant in Ireland, both north and south of the border (Dillenburger, 2011). Reports of successful ABA home interventions implemented by parents are plentiful (Dillenburger, Keenan, Gallagher, & McElhinney, 2004). Catherine Maurice (1994), the mother of two children diagnosed with severe ASD, recounts the intensive behavioural intervention carried out in the home that resulted in her children's recovery from autism and inclusion in mainstream schooling without additional supports.

In fact, parental advocacy, defined as 'public support for or recommendation of a particular cause or policy' (Oxford Dictionary, 2005), has become a major contributor to increased autism awareness. Through organized support groups and increasingly, social media, (e.g. Facebook, Twitter) parental advocacy has become instrumental at the grass roots for rising autism awareness, demanding evidence-based effective interventions, and legal rights (i.e. Maurice, 1994).

Parent advocacy for behaviour interventions has been essential in the growth of ABA-based provision of services, against the backdrop of reluctance of governments and school systems to provide ABA-based services for children with ASD in the US (Mulick & Butter, 2002), Northern Ireland (Keenan et al., 2000), and the Republic of Ireland (O'Sullivan, 2010). The success of parent advocacy to bring about the

recognition of ABA as the basis of empirically supported educational interventions for autism is nowhere more evident than in the US.

3.5.3. US Support for ABA

In addition to the support of the US Federal Government (US Surgeon General, 1999) recent legislation in most US States (Autism Speaks, 2014d) has dramatically improved the funding for behavioural interventions by requiring insurance carriers to provide coverage of ABA-based services. Still other initiatives have also added to the endorsement of behavioural interventions for ASD. The State of Maine convened a task force to evaluate the educational interventions for ASD as a means of determining appropriate State policy in the area (Maine Administrators of Service for Children with Disabilities, 2000). The task force, citing some of the key features of ABA such as the use of observable goals, reliable data collection, and programme evaluation based on data evidence, declared behavioral interventions ‘substantiated as effective based on the scope and quality of research’ (Maine Administrators of Service for Children with Disabilities, 2000).

The New York State Department of Health (1999) also recommended interventions for ASD should be based on ABA due to sufficient supporting research evidence. An international expert group, funded through US Government autism research grants, also concluded that behavioural programmes were supported by evidence (Maglione, Gans, Das, Timbie, & Kasari, 2012). Although they made the category error of using the term Lovaas/ABA for these kinds of interventions, they were given the highest rating, along with other behavioral-based interventions (i.e., picture exchange communication system, Early Start Denver Model), despite the fact that the review excluded all single subject research evidence. The Kennedy Krieger Institute of Maryland (USA), Autism Speaks (US & Canada), Research Autism (UK) are among the many agencies that promote the use of ABA-based interventions for the people with ASD whom they support.

3.5.4. Evidenced Based Practice in ASD

The term evidence based practice (EBP) will be used throughout this thesis as it appears in much of the recent literature on scientifically based interventions for ASD (Reichow, Volkmar, & Cicchetti, 2008). In fact, US legislation *No Child Left Behind* (No Child Left Behind Act, 2001) defines scientifically based research as:

Research that involves the application of rigorous, systematic, and objective procedures to obtain reliable and valid knowledge relevant to education activities and programs

(Title IX, Sec. 9101, 37).

While the research-base of behavioural interventions for ASD has been widely recognized, including by government sources, this Act paradoxically states a preference for random-assignment experiments. The US Department of Education has since provided supporting materials indicating effective practices for use by educators (e.g. U.S. Department of Education, 2014) but these do not include ASD interventions (Mesibov & Shea, 2011).

Literature reviews of ABA-based interventions for ASD, including meta-analysis of published research, have been conducted with conflicting results. The National Standards Project (2009) gave its highest rating of 'established' to behavioural interventions and noted that 2/3 of the methods in this category were derived from the science of behaviour analysis. However, ABA-based methods received a finding of insufficient scientific evidence in another published report (National Research Council, 2001).

While it may have been expected that this review process would simply rate interventions as scientifically validated for use with ASD, the contradictory results have muddied the waters (Matson, Adams, Williams, & Rieske, 2013) rather than clarify choices for substantiated practices. The debate among researchers focuses on the experimental methodologies considered as scientific evidence (Shyman, 2012).

3.5.5. Methods of Experimental Research in ASD

The literature of educational interventions for ASD offers two distinct experimental designs. Random controlled trials (RCT) utilize an approach common in medical sciences (e. g. drug trials). In a RCT treatment effects are compared between groups with a non-treatment group serving as a control (Keenan & Dillenburger, 2011). The earmarks of RCT include multiple groups of test subjects and random assignment of subjects to groups. One group receives the treatment intervention (i.e. the independent variable) while the other group does not (i.e. the control group). Data are analyzed to determine if the intervention had an effect on the subjects and if this effect supports or contradicts the research hypothesis (Green, 2008).

Alternatively, single subject experimental design (SSED) has been employed to study the effects of treatment protocols on individuals (e.g. Carr & Durand, 1985). In SSED, the target behaviour is measured prior to the application of the experimental condition and this measure is referred to as the baseline level of the behaviour. Once a stable baseline is established, treatment is commenced and additional procedures (e.g. ABA Reversal which alternates between baseline (A) and treatment (B) several times) are undertaken to establish variable control (Keenan & Dillenburger, 2012). Researchers continue to develop improved statistical analyses of SSED for comparison with traditional RTC experiments. For example, researchers have recently formulated a standard mean difference statistic that allows direct comparison with the standard mean difference statistic for intergroup comparisons (Shadish, Hedges, & Pustejovsky, 2014).

While the unit of analysis for SSED is the individual, researchers can include multiple subjects in the experiment. An example of this is the multiple baselines across participants. This methodology requires several subjects with similar target behaviours receiving the same intervention (independent variable; Horner et al., 2005). Carr and Durand (1985), for example, collected data for four individuals. Baseline measures are taken for each subject, intervention is implemented, and

outcome measures are then recorded. Data for each subject are visually analyzed through graphs for treatment effect (Horner et al., 2005). This scenario can in fact be viewed as four separate experiments that are then analyzed across subjects for comparison of outcomes. Moeyaert and colleagues (2014) recently advanced methodologies for comparisons of effect size (i.e. degree of effectiveness) across individual cases in SSED interventions. This will allow researchers to estimate effect size for individual cases and predict generalization of treatment effect to future cases (Moeyaert et al., 2014).

The merit of each methodology is considered in the debate on EBP for autism education. Intervention reviews such as that conducted by the National Research Council (2001) contend that only random controlled trials meet the full rigors of scientific evidence and, therefore, only RTC research is valid as evidence of best practice methods in educating students with ASD. Green (2008) refutes this position and argues in support of the inclusion of SSED as a scientific standard for evaluation and further declares this methodology superior to RCT.

The relative strength of RCT is in the large number of experimental subjects involved in each study (Keenan & Dillenburger, 2011). However, Johnston and Pennypacker (1993) contend that the individual focus of SSED is advantageous and particularly significant in the field of ASD due to the unique characteristics of each individual diagnosed with autism. RCT report results as average outcome across the group of participants (Green, 2008) while the treatment effect on individual participants is absorbed into this average. The statistical means are of little value to the population with ASD who present with a wide variety of deficits in multiple domains (Green, 2008; Johnston & Pennypacker, 1993). Decision-makers are more likely to be able to match the attributes of their child and targeted outcomes with those of single subject research involving children with similar attributes and goals (Green, 2008).

In an effort to develop a set of criteria for evaluation of the intervention results, Reichow and colleagues (2008) developed a set of rubrics that equates 8 SSED studies with a group studies (e.g. RCT). Odom and colleagues (2010) proposed a ratio of 5 SSED studies to two RCT experiments.

The particular strength of SSED for use with ASD, a disability with highly diverse behavioural deficits and abilities across individuals, has been ignored when taking the watered-down, ratio approach prescribed above (Mesibov & Shea, 2011). The individualized outcomes of SSED is the reason this methodology has a long, rich history of use in the field of behavior analysis with many subject populations including people with ASD (Keenan & Dillenburger, 2011).

3.5.6. ABA-based interventions compared to other interventions

While the campaign to assess the scientific basis of interventions has gained impetus from *No Child Left Behind* (No Child Left Behind Act, 2001) in the US, EBP has not become part of intervention protocol on a global scale. Although educational intervention for ASD has been a focus in Ireland (Parsons et al., 2009; The Task Force on Autism, 2001), Northern Ireland (Maginnis, 2008), and Scotland (Dunlop et al., 2009), outside of the US the call for empirically based methods in ASD education has been noticeably absent (Dillenburger, 2011).

Despite the lack an operational definition (Dillenburger, 2011), eclecticism as an educational approach to ASD has been supported by numerous government agencies and prominent academics. In the Republic of Ireland, Northern Ireland, and Scotland (Dunlop et al., 2009; Maginnis, 2008; Parsons et al., 2009) government policy has been established in support of a mixed methods approach (i.e. eclectic) rather than mandating for any one intervention as scientifically supported. Many prominent scholars of ASD in the region have also advocated in favour of eclectic approach (Cumine et al., 2000; Powell & Jordan, 1997).

Jordan and colleagues (1998) provide support for eclecticism in the education of students with ASD by arguing:

The strength of the eclectic approach is not just that it can combine the 'best' features of other interventions but that it can be responsive to the individual and to the situation. All interventions have several aspects or parts, some of which may be very different from one another.

(Jordan et al., 1998)

The implication of this position is that a range of therapies is offered based on the needs of each individual. However, in order to undertake comparative research, investigators have had to develop eclectic interventions specifically for this purpose.

Eikeseth and colleagues (2002) conducted a RCT between subjects receiving an intensive behavioural programme and an eclectic approach. The eclectic programme offered elements of TEACCH, ABA, sensory-motor therapy and other methods from the teacher's personal experience. A multidisciplinary team determined the programme. Both groups of subjects received one to one instruction for 28 hours per week over the course of one year. The behavioural treatment group showed significant gains in IQ (i.e. an average of 17 points), language, and adaptive behaviours when compared to the eclectic group (i.e. an average 4 point gain in IQ).

A similar study (Howard, Sparkman, Cohen, Green, & Stanislaw, 2005) included methods commonly used in autism specific settings (i.e. PECS, TEACCH, and discrete trial therapy) along with educational methods used in standard pre-school practice (e.g. circle time and music). The staff to student ratio was 1:1 or 1:2 for each of three research interventions: the eclectic programme described above, a behavioural intervention, and a general curriculum approach used in special needs pre-schools (i.e. not autism specific). Howard and collaborators (2005) reported significant advantages for the behavioral intervention group in the areas of cognitive, non-verbal, and communication measures in comparison to both other groups.

The proponents of the eclectic methodology (e.g. Jordan, 2004) do not offer guidance as to what interventions to include in this approach. In fact, often multiple interventions or part-interventions are combined or employed concurrently with little planning or measurements of effects (Matson et al., 2013). As there is no definition or model of an eclectic approach to ASD education, it is impossible to use scientific methods to determine the efficaciousness of this intervention. While individual parts of an eclectic model may or may not have empirical support, the combined effectiveness of these parts is less amenable to scientific scrutiny as each new permutation would require novel trials (Dillenburger, 2011).

While eclecticism is advocated as an inclusive approach to the education of individuals with ASD, the failure of its proponents to discriminate among interventions, in terms of efficacy, is a major flaw. The potential to include baseless, unsubstantiated interventions is problematic (e.g. facilitated communication, auditory integration training; Leaf, Taubman, & McEachin, 2008). This may also encourage a ‘chop and change’ mentality to take over the intervention where elements may be added or dropped without allowing for effects to be evaluated adequately (Matson et al., 2013).

Teacher training in the included interventions strategies is also problematic. Mastery of the material needed to apply multiple therapies with acceptable programme fidelity is virtually impossible (Dillenburger, 2011). Training of teachers in some of the complex intervention technologies has been proven to be ineffective when provided in short courses (Scott, Liaupsin, Nelson, & McIntyre, 2005; Van Acker, Borenson, Gable, & Potterton, 2005). Considering this evidence, it is unrealistic to expect any individual teacher to be knowledgeable in the theoretical bases and methodologies of several complex technologies with acceptable efficacy (Dillenburger, 2011).

Eclectic approaches to ASD education must be subject to the same empirical testing if these are to be included in the literature as an EBP. No RCT data are found in the literature to support many interventions (e.g. speech language therapy, play therapy) used in education, including those with ASD. Untested elements combined in this mixed approach can confound the empirical evidence for the overall programme as each component will need to be evaluated for its contribution to the overall outcome effect. It may not be possible to link positive outcomes with any one component part of the programme (Leaf et al., 2008) and it may well be that one element of the intervention is in conflict with another (Dillenburger, 2011).

Although there is some research comparing ABA-based intervention to eclectic approaches, these are minimal. Eikeseth and colleagues (2002; 2007) found increased IQ and adaptive function scores in an ABA treatment group over that of the eclectic treatment group at one and two year follow-ups respectively. Additionally, the ABA treatment group in this study showed fewer challenging behaviours and social difficulties (Eikeseth, Smith, Jahr, & Eldevik, 2007). Another study using RCT research design compared outcomes (e.g. standardized test scores for cognition, language and adaptive skills) between an intensive behavioural treatment, intensive eclectic treatment and non-intensive mixed methods treatment groups (Howard et al., 2005). The behavioural intervention group showed significant advantage over both other groups in outcome measures reported (e.g. 13 out of 29 or 45% of subjects in the behavioural intervention group showed improved IQ scores of more than one standard deviation, compared to just 2 out of 16 or 12.5% in the eclectic group).

Despite the limited comparative data noted above, the scientific support for behavioural-based interventions is clearly superior to that for other methods (Dillenburger, 2011). The EBP mandate in the US has produced conflicting results due to the application of inconsistent criteria (Odom et al., 2010). The contradictory reports on EBP have likely had an adverse effect on the application of interventions in the field as teachers and school administrators question the status of methodologies (Matson et al., 2013).

In a survey of service providers in Washington and Oregon only 54% of respondents indicated their use of ABA-based interventions for children with ASD (Downs & Downs, 2010). In fact, 72% of those using a behavioural approach were doing so with less than the recommended intensity (e.g. less than 9 hours per week instead of the 20 hour per week minimum; (Maglione et al., 2012). Despite the prevalence of ABA-based interventions, more than half of these providers used this methodology as part of an eclectic approach (Downs & Downs, 2010).

Matson and colleagues (2013) have found that parents rely on word of mouth from other parents, celebrity endorsements, and, at times, inaccurate information provided by professionals at some of the national autism organizations rather than the EBP evidence available. Although parents are making an effort to educate themselves about the best available therapies for ASD the Internet and social media present methods and experts offering endorsement in place of empirical evidence (Matson et al., 2013).

When presented with a survey of specific intervention elements of both TEACCH and ABA parents and school staff showed no preference for either approach (Callahan, Shukla-Mehta, Magee, & Wie, 2010). The researchers created survey items that removed any language that indicated the methodological origins of intervention activities (e.g. the systematic use of prompting, shaping, chaining, and fading to teach new skills) with participants favouring those items held in common between the two interventions. Callahan and associates (2010) argue that these results indicate consumer preference for combined (i.e. eclectic) interventions and therefore, refutes claims by ABA or TEACCH as evidenced-based.

The problems with the current state of EBP for ASD treatments are perplexing. While some researchers argue that the disregard for the evidential basis by consumers (parents, teachers and school administrators) is a clear indication of the social validity of eclectic and non-EBP methods (Callahan et al., 2010), others regard the problem as one of professional standards within the EBP framework (Odom et

al., 2010; Reichow et al., 2008). Choosing EBP interventions and implementing the scientifically supported methods in schools requires improved information dissemination by research professionals to consumers (e.g. parents, teachers, and ASD support groups; Matson et al., 2013).

3.6. Quality, Affordable Behavioural Interventions

Applied behaviour analysis has a long history of application with individuals with an autism spectrum disorder diagnosis (Ferster & DeMyer, 1961). The purpose of interventions using ABA methodology for people with ASD is to change behaviours in a socially significant way using methods that meet the approval of the stakeholders including the client, their family, and the local community (Baer et al., 1968). During the course of collecting more than 50 years of intervention data, reports of significant benefit from the use of ABA-based interventions with people with ASD have accumulated (Eikeseth et al., 2002; Lovaas, 1987). The most recent research results (Dawson et al., 2010; Fein et al., 2013) indicate the loss of all ASD diagnostic criteria for a number of individuals after receiving behavioral interventions.

While research results have been positive when ABA-based methodology are used with people with ASD, the availability of these interventions is not assured. For example, in the Republic of Ireland and Northern Ireland government policy has not recognized ABA as evidence-based practice for individuals with ASD (Dillenburger, Keenan, Doherty, Byrne, & Gallagher, 2012a). The preference for an eclectic or mixed methods approach to education and related services for people with ASD has had negative effects on availability of services (Dillenburger, Keenan, Doherty, Byrne, & Gallagher, 2010), quality control of service providers, and cost of services to consumers.

Parents who desire the programmes established for people with ASD by ABA professionals in Ireland, north and south, must pay these expenses out of pocket as

do families throughout most European countries (Dillenburger et al., 2010). The experience of people with ASD and their families with regard to these services in Ireland and the UK draws a sharp contrast to recent developments in the United States. Not only has ABA been increasingly accepted as an evidence-based practice in the education of individuals with autism (Maine Administrators of Service for Children with Disabilities, 2000; National Standards Project, 2009) but health insurance reform (Autism Speaks, 2014d) has improved ABA treatment availability for many Americans.

With passage of individual state insurance reforms, currently 34 US states and the District of Columbia have legislated to require insurance providers to cover diagnosis and treatment services for people with ASD (Autism Speaks, 2014d). The autism charity has been advocating for reforms throughout the US and progress to date shows only six states that are not acting to alleviate the cost of treatment for ASD.

3.6.1. US Federal and State Health Insurance Reforms

Federal legislation specifically targeting increased resource provision for autism services and research (Autism Treatment Acceleration Act, 2009; GovTrack.us, 2009) was introduced to the US Congress in 2008. After moving through preliminary stages in both houses, the bill eventually stalled on the floor of the Congress in 2009 (GovTrack.us, 2009). Originally drafted by then Senator Obama, this piece of legislation held promise of an increase in federally funded autism research and critically, the mandate for health insurers to cover both diagnostic and treatment services for ASD (Autism Speaks, 2009; Hendrix Reynolds, 2009). Embedded in this law was an explicit requirement that insurer cover treatment interventions for ASD including applied behaviour analysis (Dillenburger, 2011; Hendrix Reynolds, 2009). The failure to pass the federal statute meant the individual state initiatives to reform health insurance coverage of autism services would be the most likely source of redress for families struggling with the financial burden associated with providing services for family members with ASD (Cidav, Marcus, & Mandell, 2012).

States have been in the process of applying autism mandates to health insurers since Indiana first implemented such action in 2001 (Autism Speaks, 2014d) with a steady increase in the number of states with active reform agendas. The hope held out for financial relief by insurance reform will not come to fruition for all families, however. Since autism insurance reform is a state-by-state initiative, each of the mandates has its own criteria to include policy types affected by the mandate, benefits requiring coverage, maximum annual/ lifetime claims, and age limits for benefit claims (Sharpe & Baker, 2011).

3.6.2. Denial of ABA Coverage

The mandates for reforming health care for individuals with ASD in US states have been deemed necessary based on the practice of insurers routinely denying coverage of diagnostic and treatment services for autism for several reasons (Stuart, 2011). Most state mandates have tackled the pre-existing condition exception employed by most insurers (i.e. total barring or delayed enrolment for those with a medical condition diagnosed prior to policy enactment). State reforms have uniformly prohibited insurers from using pre-existing ASD diagnoses to disqualify potential policyholders (Stuart, 2011).

Insurance companies have regularly referred to applied behaviour analysis as an experimental treatment for autism (A. C. Harvey, Harvey, Kenkel, & Russo, 2010). When pressed on the issue of the scientific validity of ABA, insurers have pointed to the disagreement in the literature with some reports stating that ABA has not been substantiated as effective for ASD treatment (National Research Council, 2001) and others confirming the evidence supporting ABA-based interventions for autism (Maine Administrators of Service for Children with Disabilities, 2000; National Standards Project, 2009). Some states (e.g. Massachusetts; Mass. Gen. Law 175-47AA, 2010) categorically declare ABA an empirically validated treatment for ASD and preempt the exclusion of this science by insurers operating within their jurisdiction (Stuart, 2011).

3.6.3. Denial of ABA as an educational service

Although school districts have provided ABA interventions for some students, when parents have taken schools to court to compel ABA provision, the courts have routinely ruled against the families (Sharpe & Baker, 2011). Local education authorities under IDEA legislation (United States Congress, 1997) are required to provide an appropriate education for students with special educational needs but these interventions only need to be adequate (Harvey et al., 2010). So, although ABA methods have been proven effective for use with students with ASD, school districts are not compelled by SEN legislation to provide this intervention.

3.6.4. Denial of ABA on mental health or long-term illness grounds

Alternatively, insurers have also tried to shift the categorization of autism from a medical diagnosis. By classifying autism spectrum disorders as mental illness or long-term disability, insurance companies have denied coverage of treatment on non-medical grounds (Stuart, 2011). Health insurance policies regularly provide no coverage for mental health conditions. With the research unable to determine the cause of ASD, insurance companies have been effective when casting the disorder as one of mental illness (Sharpe & Baker, 2011). A number of state mandates (Indiana State Legislature, 2001) have dealt with this issue by defining ASD as a neurological disorder (i.e. a disease of the brain).

3.6.4.1. Denial of ABA services by unqualified providers

Provision of insurance covered treatment traditionally requires such provision being administered by a qualified professional (e.g. general practice MD providing prescription medication, qualified technician taking x-rays; Stuart, 2011). With professional credentialing for behaviour analysts having little government recognition or regulation, insurers refuse payment for services by non-licensed personnel. Furthermore, many interventions are carried out by uncertified staff and parents under the supervision of the certified behaviour analyst (Shook & Favell,

2008). This practice has also resulted in denial of coverage by insurance companies (Stuart, 2011). States have begun to address the issue of behaviour analyst licensure, as the increased insurance coverage of ABA interventions is likely to create a greater demand on the field. One option available to states is to issue local licensure based on the applicant possessing a BACB (Behavior Analysts Certification Board, 2014a) qualification as vetting for the state licensure procedure (Kentucky Board of Applied Behavior Analysts, 2011).

The state of Louisiana recently enacted legislation to empanel a state licensure agency for behaviour analysts within the jurisdiction (Legislature of Louisiana, 2013). The newly created licensing board will vet applicants based on their possession of certification by a nationally recognized examination administering body (e.g. BACB: Behavior Analysts Certification Board). In addition, all applicants must conduct themselves in accordance with ethical and professional practice guideline provided by the BACB, as expressed in the wording of this law (Legislature of Louisiana, 2013). Other states have included penalties for false representations of BACB qualification by ABA practitioners (State of Connecticut, 2011) as a means of regulating the profession of behavior analysis and protecting consumers against unqualified practitioners.

The addition of state-based regulation has been advocated by some within the profession as a necessary step to improve practical standards and ethics in a vastly expanding profession (Dorsey, Weinburg, & Guidi, 2009). Dorsey and colleagues (2009) point out the voluntary nature of BACB certifications (i.e. other than states with newly enacted regulations, no one is compelled to undergo the certification process). They also cite the limited resource available to the board to investigate professional misconduct by members as a serious deficiency in the organization. While it may be argued that the advent of state licensure for behaviour analysts will hasten the demise of the board certification (Dorsey et al., 2009), adoption of board standards by several states (Kentucky Board of Applied Behavior Analysts, 2011; State of Connecticut, 2011) and the active support of such licensure by the BACB

(Behavior Analysts Certification Board, 2014a) is more likely to raise the prestige of the internationally recognized register.

3.6.5. Qualification for Behaviour Analysts in Ireland and the UK

The number of behaviour analysts in Europe has been increasing over the last decade just as it has in the US (Hughes & Shook, 2007), however the percentage of BCBA among this population has been relatively low. Ireland has had its own professional organization for behaviour analysts since 1977 (Leslie & Tierney, 2013). With university programmes in applied behaviour analysis both in Northern Ireland and the Republic of Ireland behaviour analytic research has been a strength and continues to grow (Leslie & Tierney, 2013). Applied behaviour analysis in the region continues predominantly as a grassroots movement (i.e. programmes carried out by parents and others without recognized formal ABA certification; Dillenburger, Keenan, Doherty, Byrne, & Gallagher, 2012b).

3.6.6. Parent Lead ABA Initiatives

Applied behaviour analysis is the science of behaviour and as such has a complex system of knowledge required for mastery (Dillenburger, 2011). Intervention is ideally carried out directly by those with mastery of the methodology (Behavior Analysts Certification Board, 2014a), however when professional ABA services in health and education are not forthcoming alternative provision for the implementation of this evidence-based practice is necessary (Kerr et al., 2000). Through these grassroots initiative both north (PEAT, 2014) and south on the island parents have an increased support and knowledge of ABA (Dillenburger et al., 2012b). Additionally, the interventions implemented by parent therapists have provided further evidence of the efficacy of ABA-based therapies for ASD (Keenan, Dillenburger, Doherty, Byrne, & Gallagher, 2007).

The programmes developed to aid parents in administering ABA-based interventions with their own child with ASD have not included sufficient professional supervision

in a majority of instances (Dillenburger et al., 2012b). Furthermore, the original intention behind the creation of this service was not to replace the statutory obligation of government to provide effective interventions for people with ASD but to bridge the gap until government took notice of the scientific evidence in support of ABA (Keenan & Gallagher, 2002). The success of this approach, educating parents to provide ABA interventions, has impacted the public debate in Northern Ireland and the Republic of Ireland.

There is now evidence that despite the limited resources available to the charities undertaking home-based therapy, those parents who have received training are more knowledgeable about ABA than local educational and health professionals (Kerr et al., 2000). More recent survey results confirm this knowledge; parents have greater confidence in their ASD and ABA knowledge base than many of the professionals working with individuals with autism (Dillenburger et al., 2013).

In the Republic of Ireland, parents looking for ABA-based interventions for children with ASD banded together to found several ABA schools (Leslie & Tierney, 2013). Although these schools were not supported by government, a promising development on this front occurred in 2010 with an offer of funding by the Department of Education and Science (O'Sullivan, 2010). The government proposed pilot school scheme appeared to be a start of official supported ABA-based education for students with ASD in Ireland. In reality the conditions imposed on these schools (e.g. employment of traditionally trained teachers and principals, the demotion of behaviour analysts to non-teaching roles, and the dilution of behavioral principles into an eclectic methodology) effectively ended the empirically based interventions (Keenan, Dillenburger, Moderato, & Hanns-Rudiger, 2010; Leslie & Tierney, 2013).

3.6.7. ABA in Irish Universities

In previous decades university-level training opportunities in behaviour analysis did not exist in Ireland (Leslie & Tierney, 2013) but a need to staff the ABA schools and

supervise home-based programmes has seen a proliferation of university courses. Currently there are four third level behaviour analyst training programmes in Ireland and two in Northern Ireland in addition to one programme for assistant analysts (Behavior Analysts Certification Board, 2014b).

In the Irish context, ABA is seeking a place within the education sector as the evidence-based intervention for students with ASD (Leslie & Tierney, 2013) yet all programmes, bar one (i.e. the postgraduate degree in behaviour analysis at Queen's University Belfast), are based in psychology departments rather than schools of education (Behavior Analysts Certification Board, 2014b). This situation may reinforce the government position that ABA has no place in Irish schools.

In the US, the movement towards state licensure of ABA professionals has been viewed as a step away from the traditional areas of psychology (e.g. educational psychology, counseling, and family therapy) and towards an independent scientific practice of behaviour analysis (Dorsey et al., 2009; Shook & Favell, 2008). This change has been reflected in the changing membership demographics of the largest behaviour analysis professional group (i.e. Association for Behavior Analysis International, ABAI; Association for Behavior Analysis International, 2014) with the majority of new members coming from special education backgrounds rather than psychology (Shook, 2005).

Behavioural interventions, particularly those developed for children with ASD, are increasingly defined as educational programmes (Dawson et al., 2010; Dounavi & Dillenburger, 2013). As an educational methodology, it could be argued that ABA-based interventions should be implemented by education professionals (O'Sullivan, 2010). This is a particularly salient debate in the Republic of Ireland where interdepartmental cooperation has not been historically problematic (Griffin & Shevlin, 2011). As an example, very few schools have regular access to health care professionals (e.g. speech language therapist, occupational therapists) despite the policy of inclusion of diverse learners in mainstream schools (Watson, 2009).

A possible solution to this dilemma exists in the model of restricted designation for special education teachers (Department of Education and Science, 2000). This departmental circular set in place alternative certification standards (i.e. waiver for the Irish language requirement for primary teachers) for teachers in special education with qualifications obtained outside of Ireland. Alternatively, secondary school teachers are recognized by the teaching council (The Teaching Council of Ireland, 2014) as qualified based on acquisition of a degree in a specialty subject area (e.g. history or biology). This process could be extended to include behaviour analysis as a specialist area to add to the higher diploma in education as a recognized teacher qualification.

3.6.8. ABA growth despite nonsupport by government

While progress is being made in the US with local authorities establishing ABA licensure bodies and qualification criteria (Kentucky Board of Applied Behavior Analysts, 2011; Massachusetts Department of Education, 2011) there has been little advancement of the use of behavioural methodologies in schools in Ireland or Northern Ireland (Leslie & Tierney, 2013). It has been argued that the corruption of the ABA pilot schools is a reversal of previously hard won gains (Keenan et al., 2010). The Irish government policy of providing students with ASD with an eclectic approach to education (The Task Force on Autism, 2001) was enforced on these schools ending any choice of methods for these parents and their children with ASD. Ultimately the pilot schools were closed (McCormack, 2012).

The status of ABA-based education for people with ASD in Northern Ireland has seen a similar lack of progress to that in the south of the island (Keenan et al., 2010). Although parent-lead behavioural interventions continue to flourish in the jurisdiction, no governmental policy change has been forthcoming (Dillenburger, 2011). Like their neighbours to the south, Northern Ireland policymakers hold firm to an eclectic approach to educating students with autism (Task Group on Autism, 2002). Claiming an individualized curriculum drawn from multiple methodologies

and denying the evidence-base for ABA, departments of education in both countries are entrenched in their current position (Parsons et al., 2009).

The role of ABA within the eclectic approach used in special education both in Northern Ireland and the Republic is supported by short duration training courses in basic behaviour analytic methods (Keenan et al., 2010; Special Education Support Service, 2013). These courses range from one to five days duration while the recommended coursework for certification as a behaviour analysts is six graduate-level modules plus supervised field experience (Behavior Analysts Certification Board, 2014a).

3.6.9. Behavior Analyst Certification Board requirements

Professionals in behaviour analysis wishing to work in the field with a recognized qualification may seek to obtain one of several certifications offered from the Behavior Analyst Certification Board (BACB). This organization is an accredited credentialing body (i.e. the National Commission for Certifying Agencies) based in the US (Behavior Analysts Certification Board, 2014a). The BACB has a newly established Registered Behavior Technician (RBT) credential, a paraprofessional qualification designed to allow holders to work directly with clients during intervention activities under the direct supervision of a behaviour analyst. The intermediate level qualification (i.e. Board Certified assistant Behavior Analyst; BCaBA) is an undergraduate level training programme that requires direct supervision by a fully licensed analyst on a regular basis. The full licensure offered by the BACB is the Board Certified Behavior Analyst (BCBA). This professional recognition requires a masters' degree in behavior analysis or a related field (e.g. psychology, education, counseling, social work, engineering, medicine or one of the natural sciences) and entitles the certificate holder to work independently as a behaviour analyst within the context of their educational and experiential competence (Behavior Analysts Certification Board, 2014a). Supervision of other behaviour analysts requires the BCBA certification that has a special designation to identify those behaviour analysts with doctoral qualifications (i.e. BCBA-D).

Although the BACB is based in the US and has a majority of its membership in that jurisdiction, greater numbers of certificants are joining the organization from throughout Europe (M. E. Malott, 2004) including Ireland and Northern Ireland (Leslie & Tierney, 2013). In fact, the European Association of Behaviour Analysis endorses these credentials and advertises training programmes through its website (European Association for Behavior Analysis, 2007). In Ireland the Division of Behaviour Analysis (DBA) of the Psychological Society of Ireland endorses the BACB credentials (Psychological Society of Ireland, 2010). The DBA considers the BCBA qualification as the minimum requirement to implement the science of behaviour analysis with competence.

3.6.10. BACB requirements for certification

The BACB evolved from the earlier certification board for behaviour analysis in the state of Florida (Behavior Analysts Certification Board, 2014a) as a means to regulate the profession in the 1980's. Although several other states followed this lead, all regulation efforts were soon amalgamated into a national organization that became known as BACB in 1997 (Virués-Ortega et al., 2009).

There are several requirements for each level of certification (i.e. BCaBA, BCBA, and BCBA-D). All certificants must hold the relevant degree, complete classroom-based instruction, and fulfill supervised experience requirements before being eligible to take the certification examination (Virués-Ortega et al., 2009). In addition to the qualifications, discussed in greater detail below, the BACB has a code of conduct that applies to all certificate holders throughout their registration with the organization (Behavior Analysts Certification Board, 2013a). These guidelines layout the professional manner in which all certified behaviour analysts are to conduct their business in order to maintain board certification.

3.6.10.1. Task List (Fourth Edition)

The learning objectives for the formal coursework that are reinforced through experiential learning under supervision are also subject to assessment through the comprehensive exam. The BACB refers to the learning objectives as the task list as it is developed based on the duties performed by practicing behaviour analysts (Behavior Analysts Certification Board, 2012b). The board has developed an updated task list to commence with examinations in 2015 (i.e. Task List, Fourth Edition).

The task list consists of three sections consisting of basic skills, responsibilities, and foundation knowledge. The examination consists of test items directly drawn from the first two sections of the task list while the third section is only indirectly assessed (Behavior Analysts Certification Board, 2012b; Behavior Analysts Certification Board, 2013a). These sections are subdivided into six and five topics, respectively. The basic skills and responsibilities sections have a total of 115 items that are directly tested with one or two test questions covering each (Behavior Analysts Certification Board, 2014a).

Task list items include ‘use of prompts and prompt fading’ and ‘conduct a component analysis to determine the effective components of an intervention package’ (Behavior Analysts Certification Board, 2012b). Although each is a single item on the task list, these practices are in fact complex procedures in ABA methodology (Cooper et al., 2007).

3.6.10.1.1. Coursework and supervision requirements

In order to be eligible for BACB qualifications coursework has to be approved by the board. This is usually done at the university level in a pre-approval process that includes content and course sequence to be delivered (Behavior Analysts

Certification Board, 2014a). The coursework content includes ethics, behavioural assessment and intervention design, experimental assessment of interventions, graphing behavioral data, interpreting data, and a certain amount of elective topics (Virués-Ortega et al., 2009). Course sequences that are not pre-approved by the BACB must be approved by the applicant on an individual basis prior to the examination being undertaken (Behavior Analysts Certification Board, 2014a). Eligibility to be examined will be denied if the coursework requirements are not strictly met by any applicant.

These same topics for coursework content should inform the experiences engaged in by an applicant under supervision (Virués-Ortega et al., 2009). The number of hours engaged in this process differs depending on the certification sought. There are three different methods of undertaking supervised experience according to BACB regulations.

These formats are supervised independent fieldwork, practicum, and intensive practicum (Behavior Analysts Certification Board, 2014a). The direct supervision for each type is expressed in terms of percentage of hours (5%, 7.5%, and 10% respectively). This means the applicant is allowed to complete fewer total hours of experience so long as there is a higher level of supervision provided.

BCaBA are required to complete 1000 with 5% directly supervised under the supervised independent fieldwork requirements, 670 hours with 7.5% direct supervision for practicum completion, and 500 hours with 10% being directly supervised in an intensive practicum programme. The practicum options are only available through university courses taken for grade and credit (Behavior Analysts Certification Board, 2014a). BCBA hours are significantly increased on these figures.

The BCBA qualification requires an applicant complete 1500 supervised independent fieldwork hours with 5% of these hours being directly supervised. 1000 practicum hours are required with 7.5% supervised while intensive practicum has a 750-hour minimum with 10% of these being directly supervised (Behavior Analysts Certification Board, 2014a).

Supervisors are required to hold valid BCBA certification and be in direct support of supervisees at least once every two weeks. A variety of settings and activities are recommended to complete the hours of supervision regardless of which method is employed (Virués-Ortega et al., 2009). Virués-Ortega and colleagues also advise applicants to seek experiences under several supervisors if possible. This allows for a greater range of work experiences with analysts with different skillsets.

3.6.11. Autism Task List

Although the BACB does not issue a certificate for behaviour analytic practice within the field of autism spectrum disorders, it does present a list of competencies necessary for any professional working with this population (Behavior Analysts Certification Board, 2007). The knowledge required by this document is in keeping with the board policy of professional practice by behaviour analysts. Analysts are expected to limit their work to areas of individual expertise or under support of a professional with such expertise and experience (Behavior Analysts Certification Board, 2013a).

The Autism Task List has 37 specific items divided into nine content areas. These areas of competency include: developing family and professional supports, implementing and adapting new or existing curricula, proper use and analysis of assessment instruments, evaluate diagnostic tools and extract relevant information for intervention, and knowledge of the history of ASD regarding diagnostic instruments, prevalence, aetiology, and the culture of autism (Behavior Analysts Certification Board, 2007). This set of content area competencies is not included in

the certification process (i.e. subject for examination) but a certain high level of this knowledge would be gained and expected as part of the fieldwork if conducted with clients with ASD and under the supervision of a BCBA with experience in this area (Behavior Analysts Certification Board, 2012a).

The Autism Task List addresses the concern for professional competency in one of the fastest growing areas of ABA-based intervention throughout the world (M. E. Malott, 2004). While BACB professional standards (Behavior Analysts Certification Board, 2013a) require its members to engage in behaviour analytic practice only within areas of personal experience and expertise or with suitable supervision, this ethical injunction is not transparent to consumers. A qualification in autism specific content knowledge as well as board certification in behavior analysis has been explored from several perspectives.

3.6.12. UK ABA-Autism Education Competencies Project

An effort to provide quality behavioral interventions for people with autism in UK settings resulted a discussion of framework for professional standards across the topics of ABA, autism, and education as it is practiced in the UK (Denne, Hastings, Hughes, Bovellic, & Redford, 2011). The researchers sought to fill a void in professional quality assurance where BACB certifications were lacking and autism specific competencies were non-existing. ABA programmes in the UK and Ireland have a large number of entry-level workers (i.e. therapists) without qualifications (Dillenburger et al., 2012a). ABA professionals, while potentially having internationally recognized certification in the general area of behaviour analysis (Behavior Analysts Certification Board, 2012b), are not similarly qualified within a specific content area (e.g. autism spectrum disorders; Denne et al., 2011).

The UK ABA Autism Educational Competencies Framework (Denne et al., 2011) sought to develop a system to provide knowledge of autism spectrum disorders and the UK education system to ABA professionals at all levels (e.g. BCBA-D, BCBA,

and BCaBA). Additionally, this group expressed the need to develop a licensure mechanism for behavior therapists commonly engaged to implement programmes under the supervision of board certified behaviour analysts.

In response to this increase in numbers of unqualified tutors directly implementing ABA-based education programmes (Denne et al., 2011), the BACB has developed a new credential for Registered Behavior Technicians (RBT) with applications being accepted from mid-2014 (Behavior Analysts Certification Board, 2014a). This credential requires an applicant to have successfully completed second level education (i.e. high school diploma), be over 18 years of age, complete training under the supervision of a BCBA, and pass a qualifying examination administered by a BCBA. RBT credentials require supervision of all work and involvement only in tasks behavioural activities as directed by the supervising analyst.

The RBT credential alleviates one of the primary concerns expressed through the UK ABA-Autism Education Competencies Project (Denne et al., 2011) by adding internationally recognized licensure of paraprofessional behavioural tutors and therapists (Behavior Analysts Certification Board, 2013b). However, the concerns expressed regarding a uniform set of competencies in ASD is not addressed in the BACB credentialing complement. Furthermore, additional content knowledge concerns have been raised in another area of ABA-based interventions (Eikeseth, 2010).

3.6.13. Early Intensive Behavioural Interventions (EIBI) credentials

Some of the most promising research results for the use of behavioural methods with individuals with autism spectrum disorders have been in the area of EIBI. These programmes are defined by the their application of behavioural methods for as many 40 hours per week over an extended timeframe (Reichow, 2012). According to Reichow (2012) these interventions are typically home-based programmes for very young children with one to one staffing provided. Outcome results for this type of

intervention has been positive (Dawson et al., 2010; Eikeseth et al., 2002; Lovaas, 1987) and parent satisfaction rating have been high (Grindle, Kovshoff, Hastings, & Remington, 2009; McPhilemy & Dillenburger, 2013).

Despite the positive research results based on EIBI, Eikeseth (2010) has argued that not enough is known about the implementation of these programmes. The author would like researchers to determine the exact repertoire of behavioral methods necessary for the successes recorded to date. Furthermore, according to this report new courses of study concentrating on EIBI technology and including competencies in ASD, family supports, and issues of treatment integrity may be necessary to promote continued efficacious applications (Eikeseth, 2010).

3.6.14. Credentialing issues in Northern Ireland and Ireland

Behavior Analyst Certification Board accreditation of ABA professionals, soon to include paraprofessional tutors, is a widely recognized credential essential for consumer protection and quality assurance of behaviour analysis as a profession (Behavior Analysts Certification Board, 2014a). Although this comprehensive system of professional credentialing and coursework approval has increasingly been recognized internationally (M. E. Malott, 2004), including in Ireland and Northern Ireland (Leslie & Tierney, 2013), not all issues of competency have been adequately addressed to date.

Within the BACB, the investigative potential for routing out members who breach board standards of ethics are severely limited by financial and personnel resources (Dorsey et al., 2009). False representations by non-board certified individuals misusing the credentials of the BACB are beyond the organizational reach according to Dorsey and colleagues (2009). While state licensure boards in some US states (Behavior Analysts Certification Board, 2014c) have been empowered to actively pursue professional misconduct by behaviour analysts, with or without BACB

credentials (Dorsey et al., 2009), this development has little effect on consumer protection in Ireland or other locations outside the US.

Certification specific to areas of rapid expansion of behavioural interventions has also been raised. Autism spectrum disorders and applied behaviour analysis have been a focal point of research and practice for several decades (Odom et al., 2010; US Surgeon General, 1999) yet there is no autism specific behavioral qualification to indicate professional expertise in this field (Denne et al., 2011; Eikeseth, 2010). The autism task list provided by the BACB (Behavior Analysts Certification Board, 2007), although extensive in content coverage, is neither required knowledge nor subject to examination for professional certifications (Behavior Analysts Certification Board, 2012b). A credential specific to autism and educational settings, as described by Denne and colleagues (2011) when combined with BACB certifications would give professional status to practitioners with behaviour analytic and autism competencies through the proposed instruments.

Ireland, Northern Ireland and other European countries that have not embraced the efficacy of behavioural intervention for people with ASD on a governmental level continue to be without adequate safeguards against fraudulent practitioners (Keenan et al., 2010). The addition of RBT credentials (Behavior Analysts Certification Board, 2013b) will begin to provide consistent entry-level training opportunities, recognized qualifications, and comparable practices within ABA settings (Denne et al., 2011). With the success of home-based behavioural therapies and privately supported ABA schools across Northern Ireland and Ireland (Keenan et al., 2010; Leslie & Tierney, 2013) consistency of skill competencies for entry level staff will add to the consistency of programme fidelity expected of ABA-based interventions (Denne et al., 2011).

3.6.15. Conclusion

The position of the science of behaviour analysis in Ireland and Northern Ireland is contrasted greatly to that of the US. Although policy and reform efforts in the US are inconsistent across states and still many are left without a financially feasible programme of ABA (Stuart, 2011) there is reason for optimism and a platform from which to lobby for further access to ABA interventions for people with ASD (Autism Speaks, 2014d). The continued failure of government to recognize the mounting evidence-base supporting behavioural interventions for ASD has left a vacuum on the island of Ireland.

ABA programmes are growing in universities (Behavior Analysts Certification Board, 2014b) and in home-based interventions (PEAT, 2014) yet there are fewer school-based ABA services for children with ASD in Ireland, north and south (Keenan et al., 2010; McCormack, 2012; O'Sullivan, 2010). The voices of autism advocacy groups have not been heard to lobby a change in government policy (Keenan & Dillenburger, 2013) with few exceptions. One such group does supply information regarding interventions, including ABA, and has been visible in its support of ABA-based education initiative (Irish Autism Action, 2010). Otherwise it has been left to parents to group together for the services their children need (PEAT, 2014).

There are currently no recognized qualifications for practicing behaviour analysis by government agencies in either jurisdiction. Although internationally recognized certifications are available in Ireland (Behavior Analysts Certification Board, 2014a) consumer awareness of these credentials are limited and other practitioners can profit from misrepresentation of qualifications (Keenan et al., 2010). According to Keenan and colleagues (2010), lack of a recognized qualification for behaviour analysts forces families to pay exorbitant fees for services that do not necessarily measure up to professional standards.

4. Challenging Behaviour

4.1. Introduction

Globally schools have reported difficulty in finding effective methods of dealing with the challenging behaviours of some students (Arbuckle & Little, 2004; Thompson & Webber, 2010). Teachers have expressed concern regarding the level of inappropriate student behaviours and their own lack of expertise in handling these situations in Ireland (Kelly, Carey, McCarthy, & Coyle, 2007), the UK (Hartnell, 2010), the US (Thompson & Webber, 2010; Westling, 2010), and Canada (McCready & Soloway, 2010).

Classroom management techniques (Rogers, 2007) are often implemented without success for a number of students. This failure marks the ascent into a more intensive process within school discipline protocols (Thompson & Webber, 2010).

Understanding and addressing challenging behaviour begins with the difficult task of defining it. It is only with a proper working definition that successful interventions can be developed and implemented to address problematic student behaviour (Cooper et al., 2007).

4.2. Definition

Some research on school-based challenging behavior relies on a topographical definition of the problem (Arbuckle & Little, 2004; McCready & Soloway, 2010). This approach provides a list detailing pupil actions deemed as problematic. While not an exhaustive catalogue, these are specific concrete examples of the behaviours at hand. Aggressive, destructive and disruptive behaviours are those most commonly found on such lists (Irish National Teachers Organization, 2004; Matson & Nebel-Schwalm, 2007). Additional behaviours may include: self-injury, social withdrawal, repetitive stereotypical movements, and theft (Westling, 2010).

Although some studies provide participants with a formal definition of challenging behavior from which to base their responses (Westling, 2010), many others collate the response data as a method of producing the topographical definition (Lyons & O'Connor, 2006; McCready & Soloway, 2010). A consensus definition of challenging behavior among teachers is often difficult to accomplish but examples of specific behaviours from practice are readily produced (Ofsted, 2005).

Topographical definitions of challenging behaviour may be more readily agreed upon but they have notable limitations. Minor disturbance behaviours in the classroom are often reported as significant (Arbuckle & Little, 2004) yet these may not appear on the topological list of challenging behaviours. The limited severity of the single incidence of the behaviour may preclude it from a list of otherwise extreme behaviours. In addition, a topography of behaviour limits inclusion of novel behaviours not listed, so even slight variations are technically beyond the scope of the intervention (Cooper et al., 2007).

Before defining challenging behaviour, the meaning of the terms ‘challenging’ and ‘behaviour’ must be specified. In this context, the challenge denotes a social issue with importance for the individual and service providers and for which a constructive solution may be sought (Emerson, 1995).

Behaviour, defined as ‘any observable and measurable act of an individual’ (Alberto & Troutman, 2009, p.423) can be tested via the ‘dead man’s test’ to further clarify this construct.

If a dead man can do it, it ain’t behavior. And if a dead man can’t do it, then it is behavior.

(Malott & Suarez, 2004, p.9)

Thus the behavioural perspective is inclusive of the thoughts and inner experiences of the individual as well as the outwardly observable activities of the same subject

(Skinner, 1974). In other words, observable and measurable activity includes those that are observable by an individual themselves and/or others. This definition of behaviour is contrary to the popular use of the term, especially in school settings, where the term is commonly limited to the adherence to or breach of codes of discipline (Dillenburger et al., 2010).

A topography of behaviour does not provide information related to behavioural function (Dixon et al., 2012) and tends to emphasize the locus of the problem within the individual (Lyons & O'Connor, 2006). An operational definition of challenging behaviour allows determination of individual behaviours to be classified as challenging or otherwise while noting environmental factors and the role of other actors (Emerson, 1995). Challenging behaviour, according to Emerson (1995) is:

Culturally abnormal behaviour(s) of such intensity, frequency or duration that the physical safety of the person or others is likely to be placed in serious jeopardy, or behaviour which is likely to seriously limit use of, or result in the person being denied access to, ordinary community facilities.

(p. 4-5)

This definition is more inclusive than a topographical list and it acknowledges the impact of challenging behaviour on the individual, other persons, and the community; thus challenging behaviour is a social construct with wide ranging implications for the social consequences for the subject (Oliver et al., 2003).

The phenomenon of challenging behaviour among the non-disabled population is problematic for researchers. Some studies have investigated the occurrence of problematic behaviours in early childhood with the caveat that many topographies within the category are typical of the developmental stage for an individual in this age category (Dunlap et al., 2006). These researchers report toddlers and preschool children who exhibit challenging behaviour are at risk of continued poor educational outcomes when they are unidentified and denied appropriate interventions to teach adaptive skills.

For many students the continuation of problematic behaviours throughout the early school years results in special education placements. The category of emotional, behavioural difficulties/ disabilities (EBD) is a classification used in the UK (Ofsted, 1999), Ireland (Department of Education and Science, 2005) and Social/EBD in Scotland (Macleod, 2006) to denote the needs of those exhibiting challenging behaviours requiring sustained interventions beyond typical classroom management strategies. Although US legislation including IDEA (1997) identify 'serious emotional disturbance', or emotional disturbance (ED), as the classification category for children aged 0-18 who show significant behavioural, emotional or mental disorders with functional impairment of social, family or community activities (United States Congress, 1997), EBD is the term in general use among researchers and professionals (Merrell & Walker, 2004; Sutherland et al., 2008).

4.3. Prevalence

While Emerson's (1995) definition of challenging behaviour can apply to the general population (Irish National Teachers Organization, 2004), it was written with particular reference to individuals with intellectual disabilities (ID). Among those with ID there is a reported prevalence rate of challenging behaviour between 10% and 15% (Emerson, 2001; Lowe et al., 2007). The presence of challenging behaviour, in addition to intellectual disabilities, has been linked to an increased risk of institutionalization and abuse for the individual (Emerson, 2001) and increased stress for family and staff (Baker & Daynes, 2010) and school exclusion (Cooper, 2001; Wood, Blair, & Ferro, 2009).

Students with behavioural difficulties in US schools receive special education services under the ED category (United States Congress, 1997). ED prevalence rates range from 9.5 - 14.2% of children from birth to 5 years of age (Brauner & Stephens, 2006). Despite this rate less than 1% of the US school-aged population has been identified for special education services under the classification of ED (Merrell & Walker, 2004).

Challenging behaviour prevalence for students with ASD far exceed the rate of those with ID. Researchers have reported 34.3% of children diagnosed with ASD had clinically significant maladaptive behaviours (Hartley, Sikora, & McCoy, 2008). Yet another study found challenging behaviour was four times more likely in those with autism spectrum disorders than those without an ASD (J. McCarthy et al., 2010). ASD is a diagnosis of behaviour deficits in social-communication skills and behaviour excesses in restricted, repetitive behaviours (American Psychiatric Association, 2013). These factors can result in behaviours deemed inappropriate, excessive or disruptive of school-based activities (Matson & Nebel-Schwalm, 2007; O'Reilly et al., 2010).

Within ASD populations, the level of challenging behaviour has been shown to occur at a consistently high rate across age groups (Matson, Mahan, Hess, Fodstad, & Neal, 2010) and over time (Murphy et al., 2005). While there is some variance in the reported rate of challenging behaviour in ASD (e.g. 12%, Emerson et al., 2001; Lowe et al., 2007) this discrepancy relates more to the definition of challenging behaviour used in the respective studies (Lowe et al., 2007; Matson et al., 2011). The chronic and intensive nature of challenging behaviour among the population with ASD (Matson, Fodstad, & Rivet, 2009) makes the question of identification and intervention a serious consideration for schools and school personnel.

In Ireland, challenging behaviour has been presented as an issue of major concern to schools through indirect evidence (Kelly et al., 2007). This study reports high levels of teacher stress and consumption of school resources relating to challenging behaviour. A recent study of education provision for EBD in the Ireland (Cooper & Jacobs, 2011) did not estimate prevalence of challenging behaviour for the country but correlated the problem with the rates of mental health disorders for the UK (British Medical Association, 2006). Despite the absence of direct data to support claims of a growing prevalence of challenging behaviour in Irish schools, state commissioned research proposes policy change to address the issue.

With increased stress reported by school personnel (Kelly et al., 2007) and limited resources and training available to address challenging behaviour (Westling, 2010), a reactive culture has developed in schools in which teachers are overly reliant on punitive measures that have repeatedly failed to bring about positive behavior change (Thompson & Webber, 2010; Westling, 2010).

4.4. Discipline Policies in Schools

Researchers have called for a change in the culture of discipline in educational settings (Maag, 2001; Yang, 2009). Sociological studies have presented a criminalization of school discipline that includes the presence of police personnel, metal detectors, drug searches and arrests where in-house processes historically sufficed (Hirschfield & Celinska, 2011). These measures are applied more regularly with groups that are marginalized (e. g. based on race, socio-economic status) and create further disenfranchisement in the education provision (McCready & Soloway, 2010; Yang, 2009).

An example of this phenomenon is the adoption of the ‘zero tolerance’ policy by schools for weapons offences, violence and classroom disruption. This stratagem was initially employed in the US government’s war against drugs. The zero tolerance policy was a get-tough law enforcement response to increased activity by international drug cartels during the 1980’s (Martinez, 2009). In education settings, zero tolerance policies have produced mandatory sanctions that leave no room for consideration of individual circumstances or student need (Yang, 2009).

As a result of this and other reactive strategies a punishment paradigm (Maag, 2001) has developed. Common practice in schools in the US and UK is for recurring disruption within a classroom to be addressed in a uniform manner (Munn & Lloyd, 2005; Thompson & Webber, 2010). The student responsible for a disturbance, often low-level misbehaviour (e.g. talking out of turn), is removed from the class to the

principal's office or other location (Martinez, 2009). This can be the desired outcome of the pupil involved. This response is meant as a punishment aimed at reducing the problem behaviour. The procedure often has an opposite reinforcing effect with a result of increased behaviour (Woods, 2001). This process not only reinforces student behaviour, it negatively reinforces the teacher's behaviour as well. The teacher, finding respite from the offensive behaviour by removal of the student, is more likely to repeat this response, possibly for more minor offences (Maag, 2001).

The punitive culture described above, not only fails to diminish student misbehaviour, it perpetuates the behaviour through its cyclical nature (Scott et al., 2005). A more extreme version of the negative reinforcement trap, benevolent enslavement occurs when a carer submits to demands of a client engaged in challenging behaviour as a means of re-establishing order. After becoming accustomed to this level of disruptive behaviour, it may require more intense or extreme behaviour before staff submits to future demands. This cycle produces an escalation of problematic behaviours through an inadvertent shaping procedure (Emerson, 2001). The client becomes involved in a game of brinkmanship as a means of getting their needs met by staff.

The implication of the negative reinforcement trap is that the discipline policies practiced in schools are ineffective and can prove counterproductive (Scott et al., 2005). Reactive and prescriptive procedures have not improved the educational environment. Educationalists have been searching for alternatives to alleviate the negative reinforcement trap and address the needs of students who engage in behaviours that diminish their educational opportunities and those of their classmates (Maag, 2001; Osher, Bear, Sprague, & Doyle, 2010). One size fits all approaches, such as zero tolerance policies, have failed the individual students and the school systems that rely on them (Martinez, 2009).

4.5. Positive Behaviour Support

The policy dealing with student behaviour is frequently referred to as the school discipline policy (Yang, 2009). Discipline as such, is to train to obey rules with disobedience met with punishment (Oxford Dictionary, 2005). Discipline and punishment as employed in school settings are used to suppress unwanted behaviour (Maag, 2001) rather than teach appropriate behaviours. Discipline procedures, such as suspension or temporary exclusion, do not necessarily change behaviour or teach an appropriate alternative behaviour (Martinez, 2009).

While behavioural methodologies focus on positive reinforcement to build appropriate behaviours, schools tend to focus on punitive responses (Maag, 2001). It is teaching these behaviours that is the very work of schools and teachers according to Maag (2001). Applied behaviour analysis has been endorsed for teaching skills of all types (e.g. academic, social, and verbal behaviours among others) for several decades (Maine Administrators of Service for Children with Disabilities, 2000; US Surgeon General, 1999) and it is from this science of behaviour that the techniques for building appropriate social behaviours in schools have been developed as Positive Behaviour Supports (Carr et al., 2002).

4.5.1. Origins of PBS in ABA

Positive behaviour support evolved from the influences of applied behaviour analysis, social inclusion, and person-centered interventions (Carr et al., 2002). PBS makes use of many ABA-based intervention methodologies including functional assessment and functional analysis, shaping, prompting and positive reinforcement contingencies. Data collection and analysis, a hallmark of ABA-based interventions, plays a pivotal role in assessing individual needs within the multi-tier PBS system as well (Horner, Sugai, & Anderson, 2010).

PBS has evolved from an intervention specifically aimed at helping students with special educational needs in the area of challenging behaviours to a well codified

system for use at the whole school level (Osher et al., 2010). As such, this intervention is most commonly referred to as School-wide Positive Behaviour Support (SWBPS) in the literature. SWPBS is implemented across all settings within the school and engages all school personnel (e.g. teachers, administrators, paraprofessionals, bus drivers, and custodians; Bradshaw, Mitchell, & Leaf, 2010).

School wide behaviour support is a systemic application of behavioural techniques as a preventative approach to addressing behaviour in the school setting (Warren et al., 2006). Unlike critical response interventions to behavioural incidents (i.e. systems developed specifically to address challenging behaviour after its occurrence), PBS is proactive as it is implemented regardless of the occurrence or nonoccurrence of challenging behaviours (Sugai & Horner, 2002). Sugai and Horner (2002) argue that standard reactive school discipline policies teach students that they broke the rules by choosing the wrong behaviour. This method has proven ineffective over the long-term as is evidenced by the consistent reports of teacher and principal concern for pupil misbehaviour (Kelly et al., 2007; McCready & Soloway, 2010; Westling, 2010).

4.5.2. Primary Prevention Tier

Primary intervention with SWPBS entails the employment of several key strategies throughout the whole school and among all school community members. Prior to active engagement with students, a behaviour support team is established and support structures are determined (Sugai & Horner, 2002). This support team, consisting of mainstream teachers, SEN teachers, administrators, and, in some cases, outside behavioural experts, provides resident expertise and additional input to individual cases as needed.

At this initial level of intervention, acceptable behaviours in the school are defined, expectations of students and staff are outlined, and behaviour-monitoring systems are put in place (Center for Positive Behavior Intervention & Support, 2014). These

procedures are carried out in the behaviour analytic tradition of establishing clearly defined observable behaviours and determining appropriate data collection processes (Cooper et al., 2007).

Positive reinforcement procedures and response-cost (Cooper et al., 2007) are also explicitly discussed with all students and understood by all adults in the school community (Center for Positive Behavior Intervention & Support, 2014). The teaching of expected behaviours and their positive consequences as well as the negative effects of rule breaking behaviours provide for a predictable school environment (Osher et al., 2010) and refocusing on positive outcomes (Safran & Oswald, 2003).

A significant benefit to the SWPBS approach is the allocation of resources for school behaviour policy implementation (Sugai & Horner, 2002). Unlike traditional school discipline methods that rely on classroom management undertaken by every teacher on an individual basis (Yang, 2009), SWPBS creates a school wide behaviour support team, has consistent rules and consequences throughout the environment, and positive behaviours are regularly identified and reinforced (Center for Positive Behavior Intervention & Support, 2014). This approach tends to increase successful inclusion of students with EBD, ASD, and other special needs (Carr et al., 2002).

4.5.3. Secondary Prevention

The secondary or targeted level of support (Freeman et al., 2006) in a SWPBS programme is group-focused behavior intervention. Altering risk factors (e.g. poverty, community safety issues) associated with anti-social behaviour is a goal for this level of intervention (Sugai & Horner, 2002). Individual learning needs are assessed and students with similar needs are grouped for intervention purposes (Freeman et al., 2006). These working groups focus on building the skills necessary for these students to successfully participate in the school environment. For example, several students may be engaging in inappropriate behaviours that serve the function

of escape from difficult academic tasks (e.g. reading). For these students a reading group can provide added support in reading with the added effect of improving behaviour.

This targeted intervention also uses applied behaviour analysis methodology by targeting specific behaviours, determining maintaining function of the behaviour, and addressing the individual needs of students with additional positive reinforcement, shaping of behaviours, and direct teaching of deficit skills (Center for Positive Behavior Intervention & Support, 2014). Students served at the secondary level of support undergo a short functional behavioural assessment with a behaviour support team but participate in interventions with peers (Freeman et al., 2006). If behaviour change is resistant to targeted intervention individualized support initiated at the tertiary level.

4.5.4. Tertiary Prevention

More intensive behavioural support is added at the third and individualized level of SWPBS. Full functional assessment including experimental analysis is common at this level of intervention (Freeman et al., 2006). This level looks to reduce the severity of problem behaviours that continue to be resistant to behavioural methods applied at the previous levels (Sugai & Horner, 2002). Specialized systems (e.g. environmental accommodations, individual monitoring, and intensive skills instruction) are implemented (Center for Positive Behavior Intervention & Support, 2009) along with individualized strategies designed to minimize consequences of inappropriate behaviours (Freeman et al., 2006).

At this third and final level of behavioural support, Freeman and colleagues (2006) suggest expanding the support team. The intensive intervention required is complemented by the inclusion of family and community based adults who know and care for the individual student. As part of the person-centered ethos of PBS (Carr et al., 2002), this approach may lead to improved decision-making regarding effective intervention techniques, powerful reinforcers, and improved behaviour monitoring (Freeman et al., 2006).

4.5.5. SWPBS as a systemic approach

As part of its applied behaviour analysis foundations, SWPBS employs a person-centered ethos and a systemic approach to school discipline. As noted earlier, individual students in receipt of tier three interventions often begin a wraparound support programmes designed to improve the quality of life for the student both in school and outside school (Freeman et al., 2006). However, the systemic component of SWPBS has an important function to the success of the programme (Sugai & Horner, 2002).

By implanting a school-wide programme rather than classroom behaviour management strategies to address the problem behaviors, SWPBS is more likely to bring resources that would not be available under classroom management plans (Sugai & Horner, 2002). Peer support of teachers experiencing challenging behaviour in their classroom has been cited as a key protective factor for educators (Kelly et al., 2007; Westling, 2010). Behaviour support teams serve this additional purpose as well as providing trained programme implementation. The whole school approach that includes all staff and all children with a common set of expectations provides needed consistency and fairness that has been indicated as good practice for those most at risk of school exclusion (Cole, 2003; Daniels, Visser, Cole, & de Reybekill, 1999). Scarce resources are more likely to be allocated to behaviour support programmes that are inclusive of all students rather than focused solely on those who are noncompliant with school rules (Sugai & Horner, 2002).

The inclusive nature of SWPBS is evident at several levels. As noted previously, all students and staff in the learning community participate in the programme. In addition, the three-tiered structure allows students to participate in the least restrictive environment (United States Congress, 1997) as determined on an individual basis with only those in need of the most intensive interventions receiving supports separated from peers (Freeman et al., 2006). While a student may require increasingly intensive interventions, they continue to be included in primary and

secondary levels of the SWPBS programme along with peers, receiving positive reinforcement for appropriate behaviors as warranted.

4.5.6. School-wide Positive Behaviour Support in Ireland

Several resources for supporting students with challenging behaviours in Irish schools can be found with similarities to school-wide positive behaviour support as it has been implemented in US schools (Center for Positive Behavior Intervention & Support, 2009). The influence of SWPBS is detectable in charitable organizations as well as government agencies (Doody, 2009). In Ireland the application of the principles of positive behaviour supports is specified for students with developmental disabilities and SEN based on behaviour disorders (National Council for Special Education, 2012) and for whole-school communities (National Behaviour Support Service, 2013).

The Special Education Support Service (SESS) provides professional development training in the field of special education for teachers in Irish schools as a direct service agency of the Department of Education and Skills (Special Education Support Service, 2013). The National Council for Special Education (NCSE) was recently established by the Department of Education and Skills as an independent advisory body in 2003 but has yet to fulfill its remit as the implementation of enacting legislation (Government of Ireland, 2004) continues to be delayed (National Council for Special Education, 2013b). The National Behaviour Support Service, the newer of the agencies of the Department of Education and Skills, was established in reference to growing concern among stakeholders over student misbehaviour in Irish secondary schools (Task Force on Student Behaviour, 2006) and is currently operating a limited pilot programme (National Behaviour Support Service, 2014).

While each of the four behaviour support services is designed as a resource for educating students with behaviour difficulties employing a three-tiered approach, there are significant differences between them and with the models developed in the

US. The programme developed outside of the government sector perhaps bears the closest similarities to SWPBS although it is designed for a range of settings and for post-education age groups (Doody, 2009). The Callan Institute stands out as the one model that has qualified behaviour analysts develop and present the training with support from experts in the science of ABA (Callan Institute for Positive Behaviour Support, 2014).

4.5.7. Callan Institute for positive behaviour support

As part of a large charitable and religious organization, the Callan Institute was established in the 1990's through a professional development relationship with American-based ABA professionals (Callan Institute for Positive Behaviour Support, 2014). The institute provides professional development training and consultation services in relation to people with learning difficulties in all community settings (e.g. school, home, residential placements, and employment). There is no direct contact between Callan Institute and the supported individuals.

Multi-element behaviour support (MEBS), the approach developed by the Callan Institute, combines PBS with a human rights element (Doody, 2009). Utilizing the functional behaviour assessment serves to protect the human rights of individuals in receipt of behavioural supports according to Doody (2009). According to this reactive strategies infringe on the rights of vulnerable people in services and schools while positive behaviour supports avoid this consequence as well as improve the safety and well being of those implementing the programmes.

While little detailed information is presented regarding the institutes programme the connection to PBS is explicit and the use of principles of behaviour analysis are detailed (Callan Institute for Positive Behaviour Support, 2014). The staff of this organization consists of only a few individuals but there is a BCBA and a postgraduate diploma in ABA holder among the employees. Opportunities for CPD

in this method include a one-day introductory course as well as a 6-day extensive training programme.

The Special Education Support Service provides other CPD opportunities designed expressly for educators as an agent of the Department of Education and Skills (Special Education Support Service, 2013). Like the Callan Institute, the SESS does not provide direct interventions with students with SEN but serve as a training provider for teachers. The SESS has several methods available for this end, one of which is provision of resources through their website and library.

4.5.8. Special Education Support Service

The support offered to teachers of students with challenging behaviour and/ or emotional behaviour disorders may include workshops and school visits but provision of advice through online resources is very popular with teachers (Price, Waterhouse, and Coopers LLB, 2012). One such resource describes the SESS recommended use of a three-tiered system of support for behaviour in schools (O'Leary, 2011). This document is intended as recommended practice but does not necessarily make additional resources available for implementation.

The three-tiers of the approach described in this document are drawn from the literature of SWPBS and earlier PBS although no direct mention of positive behaviour support occurs in its entirety (O'Leary, 2011). Despite the great level of detailed description and recommendation of the functional behaviour assessment process (i.e. a process with its origins in applied behaviour analysis; Dixon et al., 2012; Iwata, Dorsey, Slifer, Bauman, & Richman, 1994) O'Leary (2011) does not elaborate on any other behaviour analytic methods commonly associated with PBS (e.g. positive reinforcement, shaping, or response-cost; Carr et al., 2002).

The tiers themselves are somewhat confused in this document. Tier one is referred to as classroom or school level support. O’Leary (2011) in referencing departmental policy (National Educational Psychological Service, 2007) has adapted the traditional levels of PBS (i.e. school-wide support, group support, and individual support; Freeman et al., 2006) to match the continuum of support system (i.e. classroom support, school support, and school plus support; National Educational Psychological Service, 2007). This approach creates confusion when secondary level interventions are referred to as small group or individual and tertiary interventions are similarly termed individualized programmes (O’Leary, 2011).

The inconsistency with policy become apparent when O’Leary’s (2011) advisory document for Irish teachers looking to improve student behaviour through positive behaviour supports is view in light of a report from the National Council for Special Education (National Council for Special Education, 2012). Both documents purport to specifically advise teachers of students with EBD. NCSE (2012) warns that their recommendations are not for other groups of students with other types of SEN since:

challenging behaviour in these cases may arise for different reasons and may require a different set of educational interventions.

(National Council for Special Education, 2012, p.12)

While O’Leary (2011) addresses the function of behaviour in detail, the NCSE seems to imply that behavioural function is only different across diagnostic categories of SEN rather than on an individual basis for all behaviours (Alberto & Troutman, 2009; Neef & Peterson, 2007).

4.5.9. National Council for Special Education

The National Council for Special Education (NCSE) was established under the Education of Students with Special Educational Needs Act (EPSEN; Government of Ireland, 2004) in order to support and coordinate the delivery educational services to students with special educational needs in Ireland (National Council for Special

Education, 2013b). This government agency maintains a research agenda and advises on educational policy, however the full independent authority of the council has been delayed with the stalled implementation of the EPSEN (2004) legislation (National Council for Special Education, 2013b).

The NCSE has issued its recommendations to the government for the educational support of those students with emotional behavioural disorders (National Council for Special Education, 2012) following the publication of a commissioned research and literature review (Cooper & Jacobs, 2011). The proposed intervention strategy for use with students with EBD in Irish schools is a three-tiered system with only a superficial resemblance to PBS (Carr et al., 2002).

The NCSE approach to a three-tiered behavioral support programme has adopted the previously published continuum of support offered by the educational psychology agency in Ireland (National Educational Psychological Service, 2007). As applied here, the initial level of support is presented as classroom-based behaviour interventions (National Council for Special Education, 2012). The classroom teacher may be in receipt of indirect input from the educational psychologist on a consultation basis. This intervention is intended as classroom management strategies with individualized adaptations for the student exhibiting challenging behaviour.

The second tier of intervention is presented as a school level programme but this is significantly different in practice to the school-wide PBS model (Freeman et al., 2006). In the NCSE programme, secondary interventions are developed by within school personnel with support, albeit indirect, from the National Educational Psychology Service (National Council for Special Education, 2012). Not to be confused with school-wide implementation of behaviour support, this approach refers to school-based assessment and development of interventions. The practical application of this programme becomes more transparent when consideration of third-tier supports is added to the discussion.

In the final level of support, referred to as ‘school plus’ (National Educational Psychological Service, 2007), more intensive intervention is undertaken. Direct involvement of NEPS personnel with the student in crisis is now advised (National Council for Special Education, 2012). After establishing a plan for working with the student in the school setting, the educational psychologist facilitates the involvement of community mental health services for long-term care.

This report lacks the requisite behavioural interventions on which SWPBS and PBS in its earliest iterations have been predicated (Carr et al., 2002; Sugai & Simonsen, 2012). There is no suggested use of functional assessment for determining appropriate interventions in tertiary level supports (National Council for Special Education, 2012). The approach does not include positive reinforcement of appropriate behaviours, school community-based support networks for students and staff, or direct teaching of behavioural expectations.

Despite the obvious lack key elements found in SWPBS literature, NCSE refers to the approach detailed in the advisory report as evidence-based with references to the research and data supporting school-wide positive behaviour support (National Council for Special Education, 2012). While the advisory report does not indicate use of research literature on SWPBS, a previous report (Cooper & Jacobs, 2011) provides the NCSE with an extensive review of this literature. As a result of these reports from the National Council for Special Education, its resources on SWPBS can cause confusion to readers (Cooper & Jacobs, 2011; National Behaviour Support Service, 2013).

The basis of the PBS/ SWPBS programme has been clearly established in ABA principles (Freeman et al., 2006). The NCSE (2012) has omitted many of the components on which significant portions of the evidence-base for SWPBS is drawn (Center for Positive Behavior Intervention & Support, 2009). In addition to the

inconsistencies presented in the approaches recommended by the SESS (O'Leary, 2012) and NCSE (2012), yet another government agency has provided a model of supporting students with challenging behaviours in Irish schools (National Behaviour Support Service, 2013).

4.5.10. National Behaviour Support Service

The Department of Education and Science established the National Behaviour Support Service (NBSS) in 2006 as recommended in a policy advice report on student behaviour in Irish secondary schools (Task Force on Student Behaviour, 2006). The NBSS was charged with developing support systems for schools and teachers at the secondary level in the area of challenging behaviour (National Behaviour Support Service, 2014). Since the Task Force was given the remit to find best practice interventions to foster positive behaviour in the school and classroom (Task Force on Student Behaviour, 2006) the agency created by this advisory document has selected a school-wide positive behavior support approach for Irish secondary schools (National Behaviour Support Service, 2014). The NBSS model was started as a pilot programme then later expanded but is still only supported in a limited number of secondary schools (n= 103) but only twenty schools have behaviour support classrooms as part of the tertiary supports offered by the NBSS (National Behaviour Support Service, 2013).

The NBSS refers to Response to Intervention (RtI) as the basis of its model of a proactive behavioural system (National Behaviour Support Service, 2013) rather than directly linking to SWPBS. While somewhat circuitous in its linkage, the three-tiered approach of the NBSS has its roots in SWPBS through RtI (Sugai & Horner, 2009). Schools participating in the NBSS project are required to establish behaviour support teams before commencing with programme elements (National Behaviour Support Service, 2013).

The NBSS model has many of the classic elements found in SWPBS including: three tiered intervention programmes, use of behaviour analytic procedures (e.g. positive reinforcement of appropriate behaviours, direct teaching of desired behaviors, response cost implications for rule infraction; Alberto & Troutman, 2009). The overall process is viewed as proactive, inclusive, and holistic (National Behaviour Support Service, 2014).

The three tiers (i.e. school-wide, targeted, and intensive supports) implement the SWPBS process with high level of programme fidelity with a few areas of concern. While several behavioural strategies are included throughout, intensive support (i.e. level three) does not include the use of functional behaviour assessment methods of determining appropriate interventions based on behavioural function (National Behaviour Support Service, 2013) as recommended in SWPBS (Sugai & Simonsen, 2012). Tertiary level intervention requires data collection to determine baseline of behaviour but this is describe as a basic review of past and present attainment status (National Behaviour Support Service, 2013). The collection of anecdotal evidence in this instance is not related to behavioural function as it is in the case of FBA (O'Neill et al., 1997).

Another interesting facet of the NBSS approach to SWPBS is the lack of ABA professionals (e.g. BCBA, postgraduate diploma in ABA) in the agency (National Behaviour Support Service, 2014). The staff of NBSS includes two occupational therapists and a speech language therapist in addition to a literacy specialist and a research officer. The largest group of employees is described as regional development officers (n=8) and it would be presumed that these individuals are the direct links to the project schools. While qualifications for these members of staff are not published, education support agencies are typically staffed by seconded teachers (Egan, 2004; Price, Waterhouse, and Coopers LLB, 2012).

4.5.11. Conclusion

The number of agencies providing professional development and interventions for students and schools experiencing challenging behaviour (e.g. EBD) is substantial. One such provider, as a charitable religious organization, is best viewed as a private provider although they offer CPD to health sector employees of residential and day care facilities (Callan Institute for Positive Behaviour Support, 2014). This programme has the closest links to the behavioural analytic roots of PBS (Carr et al., 2002) and employs qualified ABA professionals on its development team (Callan Institute for Positive Behaviour Support, 2014) appears to maintain the programme integrity of PBS throughout (Doody, 2009).

The several programmes intended as positive behaviour support through various agencies of the Irish Department of Education and Science each have strengths and weakness as PBS-based interventions (National Behaviour Support Service, 2013; National Council for Special Education, 2013a; O'Leary, 2011). However, the confusion within these models and between them will not provide education practitioners with clear exemplars for use of PBS as school or class level intervention for challenging behaviour.

The NBSS structure is solid but lacking in behaviour analytic methodology (National Behaviour Support Service, 2013). As a piloted programme valid experience has been gained by this provider that can be modified in future applications of the model. No plans regarding the expansion of this pilot program (i.e. to all schools, at all levels of education) seem eminent. While research literature on the use of SWPBS for school-aged children with EBD is available (Safran & Oswald, 2003), the evidence-based for SWPBS has a wider scope (Carr et al., 2002; Center for Positive Behavior Intervention & Support, 2009; Freeman et al., 2006).

The efforts made to implement SWPBS have been unnecessarily narrow in Ireland. SWPBS has been applied to all students on a district-wide basis as well in whole-schools in the US (Center for Positive Behavior Intervention & Support, 2014). As a preventative, proactive model of supporting behaviour, waiting until students are assessed as having emotional behavioral disorders is counterproductive (National Council for Special Education, 2012) as is stripping the empirically validated ABA-based elements out of a SWPBS programme (National Behaviour Support Service, 2013).

4.6. Functional Behavioural Assessment

While functional behaviour assessment (FBA) has its origins in early behavioural theory (Skinner, 1938), the amount of research and application of this methodology has increased substantially following the re-enactment of the US Individuals with Disabilities Education Act (IDEA) in 1997 (United States Congress, 1997). Although the majority of this activity takes place in the US, there is a similar increase in FBA research worldwide (Doody, 2009; Grey, Honan, McClean, & Daly, 2005; Ministers' Autism Spectrum Disorders Reference Group, 2007). The reasons for both the inclusion of FBA in the IDEA 1997 legislation and the global interest in an empirical-based protocol are demonstrated in recent reports of increasing student misbehaviour (Kelly, Carey, McCarthy, & Coyle, 2007; Westling, 2010; Yang, 2009) and the need for effective school behaviour policy throughout much of the developed world (Irish National Teachers Organization, 2004).

The punitive culture of most schools (Maag, 2001) not only fails to diminish student misbehaviour, it perpetuates the behaviour through its cyclical nature (Scott, Liaupsin, Nelson, & McIntyre, 2005). Reactive and prescriptive procedures have not improved the educational environment. Educators have been searching for alternatives to alleviate the negative reinforcement trap and address the needs of students who engage in behaviours that diminish their educational opportunities and those of their classmates.

A focus on the function of behaviour has the potential to end the cycle of ineffective, aversive, and escalating reactive strategies by school personnel (Bailey, Ridley, & Greenhill, 2010). In the US the re-enactment of the Individuals with Disabilities Education Act of 1997 (United States Congress, 1997), requires schools to shift attention to behavioural function and positive supports for students with special educational needs who are experiencing behaviour difficulties.

4.6.1. The Function of Behaviour

Behaviour is holistically defined as any ‘public’ as well as ‘private’ interaction of a biological organism (in our case a human being) with their environment (Alberto & Troutman, 2009). During a life-long history of such interactions (also referred to as the individual learning history), a repertoire of behaviours is established that affects future responses as new situations are encountered and particular outcomes are desired (Cooper et al., 2007).

In behavioural terms, the function of that behaviour is defined in relation to the contingencies of which the behaviour is a function with the assumption that all behaviour has a function (Skinner, 1953). To the layperson, it may seem there would be as many different functions as there are different behaviours. However, there are some relatively general main categories: Some consequences increase the probability that the behaviour in question recurs. These consequences are termed ‘reinforcers’ and the procedure of applying them is called ‘reinforcement’. Other consequences reduce the probability that the behaviour in question recurs. These consequences are termed ‘punishers’ and the procedure of applying them is called ‘punishment’.

Both reinforcement and punishment contingencies are behaviour- environment interactions defined by their effect on future probability of behaviour (Cooper et al., 2007; Iwata, Dorsey, Slifer, Bauman, & Richman, 1982). More detailed analysis has discovered a distinction between positive reinforcement contingencies and negative reinforcement contingencies. While both increase the probability of the behaviour in

question recurring, negative reinforcement contingencies are defined by escape or avoidance of consequent stimuli (i.e. the consequent stimulus is either ‘taken away’ or avoided) while positive reinforcement contingencies are defined by access to consequent stimuli (i.e. the consequent stimulus is ‘added’; Iwata et al., 1982; O’Neill et al., 1997). The consequent stimuli can be an infinite variation of natural, social, activity, or tangible positive reinforcers, such as fun, praise, sweets, money, a toy, or less tangible negative reinforcers, such as difficult tasks, over-stimulating environments, aversive attention from teachers.

Behaviour analysis addresses the issue of challenging behaviour by focussing on the function of the behaviour rather than the behaviour itself. Behaviour analysts view the function of behaviour as determined by the contingencies of reinforcement or punishment, even though the behaviour may be culturally unacceptable for the setting or age level of the individual (Emerson, 2001). In fact, by determining the function maintaining an undesired behaviour, the process of behaviour change can begin (Alberto & Troutman, 2009). The introduction of alternative behaviours is based on the identified function with the aim to give the student new skills, which are socially acceptable and equally useful for meeting the same function as the maladaptive behaviour (O’Neill et al., 1997).

Applied behaviour analysis, through functional behavioural assessment and analysis, use empirical methods to determine and change targeted behaviour while other researchers follow mentalistic approaches with little evidence to support their theories (Griffin & Shevlin, 2011). These constructs do not describe the inappropriate behaviour or the consequences that follow but are attributed to hypothetical internal mental states such as ‘feelings of disempowerment’ (Griffin & Shevlin, 2011, p. 204), ‘smouldering with inner anger’ (Griffin & Shevlin, 2011, p. 206), and ‘adopt a position of assumed disability and helplessness’ (Griffin & Shevlin, 2011, p. 208). These suppositions are unlike the scientific investigations of behavioural function, as they do not present observable, measurable phenomena.

These mental states have little value for informing potential interventions. It would not be possible for a researcher to obtain pre-intervention and post-intervention measures of smouldering inner anger on which to base treatment decisions and report the degree of intervention success. Additionally, these researchers only report on intervention activities relating to the behaviour of the teacher rather than that of the student (Griffin & Shevlin, 2011). As such, this theoretical exercise is neither scientific in its approach nor viable as the basis for intervention in educational settings.

In contrast, behaviourists set about meeting the reinforcement needs, evident through an individual's history of reinforcement, in ways that are acceptable in the social setting and efficacious for the person presenting the challenging behaviour (Barnhill, 2005). Applied behaviour analysis (ABA) measures its ethical application of interventions through social validity. Through consumer feedback, behavioural interventions ensure that (1) the goals of an intervention are socially important and feasible, (2) the procedures used are acceptable within the community setting and will be more likely carried out by participants, and (3) the outcomes of the intervention are significant, expected and without unacceptable side effects (Schwartz & Baer, 1991). The target behaviour must be significant in that it has marked affect on the subject and intervening to improve this behaviour will improve social interactions and community access (Baer, Wolf, & Risley, 1968). Schwartz and Baer (1991) advocate collecting information from a widely inclusive consumer groups and putting this information to use in future practice as a necessary step in creating intervention programmes based in and supported by the community.

Consumer education is important for programme validation particularly regarding the collection of feedback and its use in shaping interventions (Schwartz & Baer, 1991). It is this societal participation and acceptance of behavioural methods that makes applied behaviour analysis an 'applied' science (Baer et al., 1968, p. 92). Social validation is an important element of the expansion of behaviour analytic research (Schwartz & Baer, 1991).

Much of the social validation of an intervention is established through the FBA process; when first defining the target behaviour, the social significance of this behaviour is considered (Gresham, 2003). The assessment process is used to determine the function of the target behaviour and therefore the most effective means of changing that behaviour. According to Gresham (2003), the results of an intervention must then be evaluated in light of the stated goals of the FBA. The subject should have newly acquired skills and an increased opportunity for social inclusion because of an efficacious FBA and intervention (O'Neill et al., 1997).

4.6.2. The Origins of Functional Behavioural Assessment

Although the use of procedures described as functional behavioural assessment (FBA) has spread, the origins of the technology are often unexplained in the text (e.g. Irish National Teachers Organization, 2004; Jordan & Cornick, 2000). The discussion of FBA techniques has occurred without reference of this direct link to its parent technology (i.e. ABA). Moreover, certain publications have made a point to differentiate the methodologies of FBA from the science of ABA when recommending the former and discounting the efficacy of the latter (Task Group on Autism, 2002). Many other researchers correctly attributed these methods and the complete technology to the science of applied behaviour analysis (Gresham, Watson, & Skinner, 2001; Kates-McElrath, Agnew, Axelrod, & Bloh, 2007).

Antecedent-behaviour-consequence (ABC) charts, a commonly referenced method of assessment of behaviour (Baker & Daynes, 2010), have been proposed as effective practice in schools (Irish National Teachers Organization, 2004; Jordan & Cornick, 2000) while ignoring the developmental history of this particular tool. This basic strategy, sometimes expanded to increase information-gathering capacity (Zarkowska & Clements, 1988), is a product of ABA research and practice dating back to the 1980s (Carr & Durand, 1985; Iwata et al., 1982). In fact, this particular methodology emanates from the early works of BF Skinner (1938) when the noted

behaviouralist promoted the three term contingency view of stimulus- response theory.

Before the focus on function, behaviour modification applied indiscriminate punishment and/ or reinforcement contingencies based on the existence of the behaviour without assessment of the behaviour's purpose or behavioural repertoire of the individual client (Alberto & Troutman, 2009). Practitioners often found these methods affected negatively on the quality of life of the intervention subjects and those administering the programme (Sasso, Conroy, Stichter, & Fox, 2001). The convoluted history and misuse of the term behaviour modification, complete with links to aversive and unproven practices, has resulted in disuse of this terminology within the behaviour analytic field (Alberto & Troutman, 2009; Sasso et al., 2001). The refinement of the science and practice of ABA through empirical research, exemplified by its disassociation with behaviour modification and its spurious procedures, is responsible for the position of high regard held by FBA (Gresham et al., 2001).

All principles and procedures of the FBA process should be rightfully situated within the science of ABA (Baker, 2011; Buschbacher & Fox, 2003). Hagopian and Boelter (2005) further declare all processes which use a scientific approach to measuring behaviour and controlling the environment are ABA-based techniques:

This includes 'functional behavioral assessment' and approaches such as 'Positive Behavioral Support' and forms of 'Behavior Therapy' that rely on direct observation of behaviour and analysis of behaviour-environment relations.
(Hagopian & Boelter, 2012)

FBA was created within the scientific community of behaviour analysis; its methods were refined through the research of behaviour analysts (Dunlap & Kincaid, 2001). The process of functional assessment is in fact at the core of modern ABA practice (Dillenburger, 2011).

This fact makes those who advocate the use of FBA (Jordan & Cornick, 2000) while dismissing the parent technology (Jordan, Jones, & Murray, 1998) appear confused, or perhaps disingenuous. Without the parent technology of ABA, FBA would not have developed into the empirically based process advocated in the IDEA (United States Congress, 1997) re-enactment (Gresham, 2004).

4.6.3. Definition of FBA

As discussed above, the precursory technology to functional behaviour assessment was behaviour modification (Sasso et al., 2001). This approach to behaviour change lacked the essential element of FBA, that is the central focus on behavioural function. These procedures were often found to be repressive, lacking in positive skills building components, and having short-lived results. A behaviour suppressed without regard to function often reappeared, sometime with a differing topography or increased intensity (Sasso et al., 2001).

Functional behaviour assessment has one purpose: to inform an effective and efficient intervention for behaviour change (O'Neill et al., 1997). Scott and Kamps (2007) state the aim of FBA is to single out the 'contextual variables' responsible for maintaining a target behaviour and using this information in a scientifically sound programme for change.

The message that we send must be clear: intervention is not based on behavior- it is based on the function of that behavior.

(Scott & Kamps, 2007, p. 151)

Providing positive support for these students is based on the function of the inappropriate behaviour (Wood, Blair, & Ferro, 2009).

While the IDEA (1997) legislation gives legal status to what had previously been proposed as best practice (Iwata et al., 1982; O'Neill et al., 1997), the re-enactment

of the law does not provide a definition of the technology it requires of educators. Gresham and colleagues (2001) clearly define FBA as:

‘a collection of methods for gathering information about antecedents, behaviors, and consequences in order to determine the reason (function) of behavior’ (p. 157).

FBA has a long history of data collection and a vast literature base, for example, in prominent publications such as *The Journal of Applied Behavior Analysis* (Gresham, 2004). While the ABA tradition is not specified in the US legislation (Gresham et al., 2001; Kates-McElrath et al., 2007) it can be argued that this is not necessary, as legislation is typically mute on the traditions from which policy or law is derived (Dunlap & Kincaid, 2001). This is not a defense for academics who, while being explicitly opposed to behaviour analysis and thus may deny the origins of the technology (e.g. Jordan & Cornick, 2000), still use the definitions developed over the decades of behaviour analytic practice.

Given this potential for misrepresentation, it is important to determine, in detail, the difference between Functional Behavioural Assessment (FBA) and Functional Analysis. (1) FBA is based on indirect assessment and direct/ descriptive methods, such as observations in natural settings and caregiver interviews. (2) Functional analysis on the other hand involves the setting up of analogue, experimental situations that aim to determine exactly the function of the behaviour (Gresham, 2003). These are distinct procedures aimed at producing a complete analysis of behavioural function (Sasso et al., 2001).

The most basic assessment tools in FBA are those that do not focus on direct observation of the target behaviour but use other methods to glean information about the individual and the behaviours of concern. These informant methods involve questioning those most familiar with the individual about the behaviour after it has occurred (O'Neill et al., 1997). Included in this methodology is: record review, rating

scales, parent/ teacher questionnaires, and functional assessment interviews (Gresham et al., 2001; Neef & Peterson, 2007; O'Neill et al., 1997).

The information obtained through this rudimentary procedure is used to inform the next step of the process, direct observation methods. This component requires systematic observation of the individual in the natural setting in which problematic behaviours reportedly occur (O'Neill et al., 1997). The most common forms of direct observation of challenging behaviour (Gresham et al., 2001) in school settings involve completion of antecedent-behaviour-consequence (ABC) charts (Baker & Daynes, 2010) and scatterplots (Emerson, 2001) which chart behaviour occurrence and frequency.

These items and other measures are used to produce a working hypothesis of the function of behaviour (O'Neill et al., 1997). These methods alone can not indicate a causal relationship between variables but simply suggest a correlation (Gresham et al., 2001). A more definitive result is only obtained from data collected during functional analysis (Doggett, Edwards, Moore, Tingstrom, & Wilczynski, 2001).

A functional (or experimental) analysis requires the systematic introduction and/or removal of antecedent and consequential variables, one at a time, in order to produce observable, recordable change in the target behaviour (Cooper et al., 2007). This process requires a systematic manipulation of the variables hypothesised to affect behaviour change. The establishment of this relationship offers a great degree of empirical evidence for the actual function of the target behaviour (Emerson, 2001). This evidence is required before credibly declaring a causal relationship exists between the variable and the behaviour.

4.6.4. Function of behaviour and intervention

The requirements of IDEA (United States Congress, 1997) extend beyond the application of FBA technologies in cases of challenging behaviour; it also compels schools systems to apply the results of the FBA to behaviour implementation plans (BIP). Once again, however, this legislation is silent when it comes to definition of the behaviour implementation process (Weber, Killu, Derby, & Barretto, 2005) and it is left to state education officials and those in the field supporting students with challenging behaviours to interpret the intentions of the law.

Positive behaviour support interventions should rely on the same function of the challenging behaviour to promote the acceptable behaviour (Scott & Kamps, 2007). In addition to teaching skills with functional equivalency, O'Neill and colleagues (1997) argue that replacement behaviours should also require less effort to obtain reinforcement. The FBA process should determine replacement behaviours that are effective and efficient for the student in order to ensure their use (Buschbacher & Fox, 2003; Emerson, 2001) increasing the likelihood of intervention success.

Function-based intervention for challenging behaviour is not universally accepted as a necessity, however. While some research has shown greater positive results for BIP based on determined function, non-function based intervention for the same individual has indicated limited improvement of challenging behaviour (Ingram, Lewis-Palmer, & Sugai, 2005; Newcomer & Lewis, 2004). These results suggest FBA may not always be a cost effective component of intervention.

Through a literature review of 150 studies that involved school-based behaviour interventions published in the *Journal of Applied Behavior Analysis* between 1991-1999, Gresham and colleagues (2004) found the absence of FBA information to be a non-factor in determining effectiveness of the BIP. While recognizing FBA based interventions do prove effective in BIP, this research shows the labour and resource

intensive approach can be no more productive than more cost effective, traditional methods of behaviour management employed in schools (e.g. behaviour modification techniques). The lead researcher calls for further studies designed to determine the circumstances under which a full FBA is necessary and when efficacy does not require this (Gresham, 2003).

Counter to this argument, Scott and Kamps (2007) articulate the position that it is only the full FBA procedures, inclusive of experimental analysis, that has empirical support through research. Gresham et al. (2004) limited their research to FBA procedures taking place in school settings, while the larger environmental settings produce stronger support for function-based interventions. Scott and Kamps (2007) report that adaptive FBA procedures (e.g. checklists, questionnaires) are practical for administration in schools settings and would provide a useful compromise, however, these authors caution the scientific evidence is insufficient to support the inclusion of these measures under FBA.

4.6.5. Debated Issues in Functional Behaviour Assessment

While there is widespread support for the use of functional behavioural assessment in cases of challenging behaviour, as indicated above, there are several issues of contention regarding this methodology. Among the debates in the literature are: the content elements of functional behaviour assessment (Moreno, 2010), efficacious use of these methods in community settings such as schools (Scott & Kamps, 2007) and the development of adaptive procedures for use in practical settings by staff with minimal training (Gresham et al., 2001).

The initial uncertainty in the literature occurs with search terms to access research studies and peer-reviewed articles on the subject. The terms functional behavioural assessment and functional assessment as well as functional behavioural analysis and functional analysis can be found in scholarly journals and subject specific textbooks. The addition of 'behavioural' in the terminology is in recognition of the use of

functional assessment by other fields of study including other disciplines within psychology (Cone, 1997). Among those working in the science of ABA, this additional verbiage is superfluous as behaviour is the focus of the discipline in toto. Dunlap and Kincaid (2001) not only agree that these terms are synonymous but further argue the language of the IDEA (United States Congress, 1997) legislation, specifically functional behavioural assessment, dictates use of behavioural strategies and its corresponding theoretical outlook.

Confusion of terminology is evident throughout the literature on FBA. Doody (2009) reports indirect methods of information gathering, traditionally used in FBA by behaviour analysts, but considers these activities separate from the assessment activities described in the study. Mistakes of this type are not evidence of a lack of formal or advanced training in the behaviour analytic science. Research by Davey and Lignugaris/Kraft (2005) is confounded by their article abstract which declares a ‘functional assessment’ was not performed during their study (Davey & Lignugaris/Kraft, 2005, p. 255) and yet, further investigation reveals it was a ‘functional analysis’ that they determined problematic and therefore was not included (Davey & Lignugaris/Kraft, 2005, p. 261-262). This reporting error is particularly significant as both authors hold PhDs and the first author is board certified as a behaviour analyst.

As indicated by the examples outlined above, further inconsistencies exist when attempting to delineate the procedures included in functional assessment and functional analysis. Doody (2009) carries out information gathering activities that are not described as part of the functional assessment component of her proposed model. Although this is a minor flaw in her report, the article makes a more important omission: there is no clear indication of procedures included in the functional assessment discussed. Even research reports by ABA professionals often fail to describe precisely what methods were carried out as part of the FBA procedures (Sasso et al., 2001).

Wood et al. (2009) found the lack of procedural detail of functional assessment problematic when reviewing research papers published over a 17-year period (1990 - 2007). Only 35 articles gave sufficient data to be included in their study. In this review experimental analysis of hypothesis was designated an element of FBA (Wood et al., 2009).

Because IDEA (United States Congress, 1997) requires each state education agency to report compliance with its mandates, Weber et al. (2005) reviewed the procedural policies for FBA of 48 out of the 50 states. The researchers itemised 14 FBA procedures for which supporting documentation was sought. Forty-one states had this information available to the researchers and those charged with performing FBAs in these jurisdiction. However, these resources lacked information on the theoretical and scientific basis for the procedures. With little guidance in the use of the materials provided, ineffective FBA was not precluded by this omission (Weber et al., 2005).

Also responding to the US legislation formalising the requirement of FBA for schools, Barnhill (2005) and Sasso et al. (2001) provide functional assessment criterion for use in schools. These reports add the behaviour analytic basis behind the procedures as well as historical context of FBA in the science of ABA. Both articles include experimental procedures within the parameters of FBA as a means of testing hypotheses.

In a review of FBA manuals specifically designed for use in community settings, Dunlap and Kincaid (2001) lament the lack of cohesion among ABA professionals with regard to the core activities included among functional assessment practices. There is presently an opportunity for ABA practitioners to launch the behaviour analytic science into the mainstream of education as learned FBA team leaders or suffer a substantial setback to its credulity as result of poorly designed and executed behavioural interventions under the FBA epithet (Dunlap & Kincaid, 2001; Weber et al., 2005).

Another issue without consensus in the literature is the adaptation of FBA methodologies for use in school settings and by school staff. While some researchers support the use of the standard FBA procedures by teachers in schools (Alberto & Troutman, 2009; Thompson & Webber, 2010), others find this practice problematic. The level of training provided for teachers to lead a FBA process has often fallen short in terms of outcome measures (Scott, Liaupsin, Nelson, & McIntyre, 2005; Weber et al., 2005). Gresham et al. (2001) maintain administration of these technologies by untrained staff lower the validity and reliability beyond an acceptable level. These authors suggest teachers without formal, extensive expertise in the area of behaviour analysis assess only the simplest cases of behaviours that challenge; a position supported by Sasso and colleagues (2001).

Other researchers have been more proactive by developing methodologies specifically alleviate these concerns. Matson and Minshawi (2007) have put forward two alternative techniques, checklists for functional assessment and brief functional analysis for use by teachers and others with less training than that required for a recognized qualification in behaviour analysis. Scott and Kamps (2007) have suggested intervention based on hypothesized function for use in non-clinical community settings, such as schools and outpatient medical centres. Although Matson and Minshawi (2007) point out that there is room in the area of behavioural intervention for new community based practices to develop, they correctly emphasize the need for research based verification of these methods. The amended techniques developed for use in schools by school personnel must meet the scientific standards applied to other FBA methodologies. Until there is evidence to confirm these methods, FBA programme fidelity is only assured with the participation of a qualified behaviour analyst (Gresham et al., 2001; Scott & Kamps, 2007). The use of FBA in school settings is on the rise (Kates-McElrath et al., 2007) and, in the US context, a requirement of law (Van Acker, Borenson, Gable, & Potterton, 2005) but there is disagreement in the literature as to the best approach for implementation of this technology.

4.6.6. Team approach to conducting FBA

The concern over levels of teachers' skill in implementing FBA procedures is not only found in the research community (Dunlap & Kincaid, 2001); teachers and principals also have voiced major concern when facing what is perceived to be an increasing amount of behavioural challenges in the school settings (Westling, 2010). Some studies (Van Acker et al., 2005; Weber et al., 2005) have shown inadequate levels of training in FBA/ ABA for teachers have resulted in less than efficacious interventions. The rise in frequency of FBA in the US, due to requirements under the law, exacerbates the need to find an efficacious and economical means of delivering these protocols (Van Acker et al., 2005). The dilemma therefore, is how to carryout valid and reliable FBA while building the requisite skills of onsite personnel (Scott & Kamps, 2007; Wood et al., 2009).

Kelly and colleagues (2007) report an alarming response from Irish teachers and principals who feel they lack the prerequisite training to handle the challenging behaviours that present in their schools. These respondents specifically cite insufficient skills in the use of evidence-based methodologies (Kelly et al., 2007). Westling (2010) adds that teachers surveyed indicated a limited amount of training in the use of ABA-based procedures (including PBS) but relied rather on personal experiences gained since beginning teaching.

Reports have been published on the results of multidisciplinary teams performing FBA. Van Acker and colleagues (2005), who reviewed FBA/ BIP submissions from 71 school-based teams, found the resulting assessments did not conform to acceptable standards despite some groups having members with training, albeit to a minimal standard. Similar findings by Scott and colleagues (2005) report few teams implement an intervention based on FBA results and most resort to punitive measures for the behaviour change plan. In both instances, participants were provided nominal training in behavioural techniques for functional assessment. These researchers, upon analysis of their projects, deduced that the training provision

was insufficient to produce valid FBA and BIP (Scott et al., 2005; Van Acker et al., 2005).

Calls for increased teacher training in empirically validated methods, such as FBA and positive behaviour supports (Moreno, 2010) are supported by the research. An example of this approach, Grey and colleagues (2005) conducted a seven-month teacher-training programme before implementing FBA/ BIP procedures that produced an 80% success rate for behaviour change. These researchers propose training teachers to implement FBA/BIP as it provides a better working relationship between teacher and student, utilizes the teacher's extensive knowledge of the student, and is more economical than an external expert consultancy model (Grey et al., 2005).

Despite this result, the utilization of behaviour analysts as FBA team leaders is the only means of assuring the validity and reliability of FBA procedures in school settings (Gresham et al., 2001; Sasso et al., 2001; Scott et al., 2005). Others see the team approach to FBA as expert-lead training for teachers and other school staff who will eventually master the process (Buschbacher & Fox, 2003; Weiss & Knoster, 2008).

In Toronto, Canada, a task force charged with making recommendations to the minister of education and the minister for children called for the development of teams of service providers, including school psychologists with ABA qualifications, as a support for school personnel implementing evidenced based interventions for student with ASD (Ministers' Autism Spectrum Disorders Reference Group, 2007). In fact, many US state departments of education have adopted the policy of using individual education plan (IEP) teams as the basis for FBA/ BIP intervention teams (Van Acker et al., 2005). Expert lead teams, including teachers, would provide FBA/ BIP that maintain high standards of validity (Scott & Kamps, 2007) and remain economically sound (Grey et al., 2005) while developing future skilled assessors at school level.

5. Inclusive education and special educational needs

5.1. Introduction

Many nations currently hold educational policy positions in favour of the inclusive education of students with special educational needs (SEN) in settings with typically developing peers. The United Nations has addressed the issue of inclusion of people with disabilities across social structure (e.g. education, employment, and independent living) with many nations endorsing the principles (United Nations, 2006). Several degrees of acceptance of these rights are possible through the various stages of UN process. There are two sections to the agreement: the convention and the optional protocols. While the convention outlines the human rights applicable under the documents, the optional protocols allow individuals with disabilities to seek remedy from the UN for breaches of these rights by ratifying states (United Nations, 2006).

Member states may sign in support of the convention or ratify the rights compelled by the convention document. Further, governments can indicate support for the optional protocols by signing and ratifying this section. The United Kingdom has signed and ratified both sections of the Convention on the Rights of Persons with Disabilities and as such, UK citizens can apply to the UN to investigate and remedy when a ratifying state does not meet its obligations under the convention. Both Ireland and the US has signed the initial convention document but have not progressed to ratify it or the optional protocols. In essence both governments have signed in support of the rights outlined in the convention but have not agreed to be held liable to their implementation or obliged to the UN enforcement efforts.

In the US, individual states have legislated for inclusive education practices (Massachusetts General Law, 1972) before federal regulations establishing the right of children with SEN to education in their community school. US legislation PL94-

142 (1975), modeled on the earlier Massachusetts' law, was later renamed and amended several times with the Individuals with Disabilities Education Act (2004), established the concept of education in the least restrictive environment (LRE; environment and curriculum as close to that of nondisabled peers as possible while maintaining effectiveness).

In the United Kingdom, the Warnock (1978) report began the movement of government education policy towards inclusion for students with special educational needs. This philosophical stance was reaffirmed with the acceptance of the Salamanca Statement (1994), which gave United Nations support to the rights to inclusive education for children with special needs. Several policy papers have been developed as well, including Excellence for All Children (1997), that aspire to increasing the level of inclusive education of students with SEN in mainstream schools.

In the Republic of Ireland the Education Act (Government of Ireland, 1998) made first reference to inclusion of all students and specifically those with SEN but the enactment of the Education for Persons with Special Educational Needs (EPSEN) Act (Government of Ireland, 2004) has been necessary to make inclusion practical by creating structures and supports (e.g. special educational needs officers, the National Council for Special Education, and the Special Education Support Service).

The role of schools providing social and cultural inclusion is not a new concept. John Dewey (1916), a proponent of education reform, described the American school as an environment where races, ethnic customs, and religions were assimilated into a common American culture. In addition to education providing social knowledge to the current generation, the mingling of cultural diversity propelled society forward to new understandings of community. Similar to Dewey's contention, current changes to Irish society, brought about by the recent increase of mainly European immigrants, has expanded the context of inclusive education to incorporate issue of diversity of language, culture, and religion (Drudy & Kinsella, 2009). Although the

broad concept of inclusive education expressed by Dewey (1916) includes the issues relating to special educational needs, it is the specific area of educational inclusion of students with diverse learning disabilities that is the focus of this dissertation.

From the earliest days of de-institutionalization through the era of mainstream integration and the current global support of inclusive education, few argue for exclusion as a policy, yet there is debate regarding the extent and form of inclusive education. Full inclusionists call for the closure of segregated special schools and classes as counterproductive to the policy of inclusion (Ainscow & Miles, 2009). Educational outcomes for students with SEN are considered optimal in mainstream settings according to this view. Moderate inclusionists argue that the placement is less important than the effectiveness of the instruction (Low, 2007). Some opponents to inclusion state that inclusive classrooms limit the resources available to typically developing students because of the high intensity needs of the SEN students (Shevlin, Winter, & Flynn, 2012). Educational inclusion has been withheld from segments of the SEN population (e.g. students with emotional disturbance, students with ASD) in the UK (Cooper, 2007) and Ireland (O'Gorman & Drudy, 2010) and in the US (Skiba, 2002). Several arguments have been made for instances of segregation of students from typically developing peers. Irish legislation (Government of Ireland, 2004) calls for inclusion of students with SEN unless the mainstream setting is nonproductive for the student or the student's presence hinders the educational progress of classmates.

While social inclusion (i.e. inclusion in the community, school, and employment) is a concern for individuals and groups with an interest in SEN, there are several key issues involving the education system that need to be addressed. Among these is the meaning of terminology such as inclusion, integration, and mainstream education. The various different models of inclusion and the effects these have on ancillary issues including disability labels and individual education plans must be addressed.

5.2. Inclusive education: definitions and applications

Several terms have been associated with the progressive reform of education for students with disabilities. While these terms are often used interchangeably and to indicate a similar process (Ainscow, 2005), considerable differences exist as they represent educational practice over four decades. Integration, mainstreaming, and inclusion are the most common terms encountered in the literature on special education when referring to placements for students with sensory, physical, and cognitive impairments in the same schools and classes as typically developing children (Meegan & MacPhail, 2006; Vislie, 2003). According to Lindsay (2007), the term ‘mainstreaming’ has been considered synonymous with inclusion but is used infrequently outside the US. The difference between inclusion and integration, however, is more substantive.

From the 1960s through the 1990s, integration of students with disabilities was the dominant focus of reformers in this field (Vislie, 2003). The term was used to describe an approach to special education that was contrasted with the segregation of students in special schools and later, separate special education classes. By definition ‘integration’ meant the placement of students with special educational needs in ordinary, community schools. This was later refined to indicate the placement of these students in ‘mainstream’ classes where it was mainly left to the student to adapt to this new environment (Lindsay, 2007). Jarvis (2007) equates this approach with requiring the student with special needs to put together a puzzle with only limited assistance. Integration of students with SEN had only to do with placement; attainment of the students once in the setting was not a consideration (Farrell, 2000)

Although often used interchangeably with inclusion, ‘mainstreaming’ was at one time seen as a process of moving students with SEN from segregated settings into regular schools and classes. This was accomplished on a gradual or partial basis and included pull out supports, such as resource teaching (Meegan & MacPhail, 2006). Today the term ‘mainstreaming’ is frequently used in schools to mean inclusive placements but the term is no longer used in inclusion research (Lindsay, 2007).

Inclusion or inclusive education has become the predominant terminology in the field of education for students with SEN (Vislie, 2003).

Although originating in the 1990's through documents such as *The Salamanca Statement* of the World Conference on Special Needs Education (UNESCO, 1994) and *Inclusive Education at Work* (OECD, 1999), general acceptance and use of this language became global in the first decade of the new millennium (Meegan & MacPhail, 2006). This terminology has been differentiated from prior terms by being more progressive in its expectations of educational placements and practice.

The Salamanca Statement (1994) calls for the education of students with disabilities alongside their peers regardless of the degree of physical, emotional, cognitive, or linguistic disability, wherever possible. However, the agreement also states:

For children with special educational needs a continuum of support should be provided, ranging from minimal help in regular classrooms to additional learning support programmes within the school and extending, where necessary, to the provision of assistance from specialist teachers and external support staff.

(Salamanca Statement, 1994 p.24)

Accordingly, full inclusion is not the only model supported by the Salamanca Agreement (1994) with stipulations for pullout resource or special class provision as needed by individual students.

Inclusion has been defined as a continual process of evolving school cultures and practices to facilitate the placement, participation and achievement of all students within a single learning community (Ainscow, 2005). Significant differences have emerged between the practices of integration and inclusion going beyond a simple change in terminology (Farrell, 2000).

Educational inclusion for students with SEN entails placement in regular classrooms with non-disabled peers, as does integration. However, inclusion requires that the mainstream system accommodate the learning needs of the student with SEN even by bringing additional resources into the classroom (Meegan & MacPhail, 2006). There is, beyond this, an important requirement that the inclusive placement be beneficial for the student with SEN (Lindsay, 2007; Ainscow, 2005; Vislie, 2003). It is the beneficial nature of the placement that separates the earlier reforms of integration and the modern inclusive education movement. Although this may be more about added emphasis in the case of the latter (Vislie, 2003), the efficacy of the placement of the student is of greater consideration in the inclusion debate.

Although the evolution of the concept of inclusion continues to develop beyond the confines of the field of special education, this process is beyond the scope of this thesis and will be addressed only briefly. Ainscow (2005) draws attention to the fact that inclusive education is being subsumed under a broader reform effort by social inclusionists. An emphasis on supporting diversity throughout communities has broadened efforts beyond SEN and beyond the schoolhouse walls. As a global trend, expanding inclusion to diverse groups across society as a means of fighting exclusionary practices is an interesting development. Social inclusion deals with community factors such as economic disadvantage, unemployment, and homelessness that create barriers to participation in society (Government of Ireland, 2007). However, educational practice is more closely concerned with inclusion as a process within the structures of the education system despite the parallels that may be emerging in the wider community (Ainscow, 2005).

5.3. The Inclusion agenda and special schools in the UK and Ireland

Special schools for students with SEN in the United Kingdom and the Republic of Ireland have had a long history of providing educational and care services in segregated settings. For the most part, special schools have progressed only moderately over recent decades despite the policy positions supporting inclusive

education (Shevlin et al. 2012; Lambe, 2007). Although the public is firmly supportive of the inclusion movement, there are suggestions that government agencies and documents contribute to the confused state of affairs by wavering in the language (e.g. inclusive environment/ in a integrated setting; Department of Education and Skills, 2014) used to address the issue of school inclusion and providing soft options (e.g. NCSE called for the EPSEN act to be fully implemented as soon as resources permit; National Council for Special Education, 2013a; O'Gorman & Drudy, 2010).

In the Republic of Ireland for example, legislation intended to ensure that the education sector implements inclusive practice (i.e. ESPEN, 2004) allows for the abdication of these legal obligations based on financial considerations (Meegan & MacPhail, 2006) such that individual schools can continue to refuse admission to student with a SEN until resources are made available to the school in support of the placement of the student (Watson, 2009).

Research in Northern Ireland points to inclusion efforts decreasing the number of students enrolled in special school while numbers of school exclusions based on behavioural grounds and students with educational statements (e.g. IEP) has increased (Lambe, 2007). Lambe (2007) also reveals a trend in schools in North Ireland that indicate a dual system when inclusive education is considered. Selective schools have shown little change in student diversity prior to the 2007 research while the greatest promotion of inclusive practice has occurred in non-selective schools.

Support for a dual education system, consisting of mainstream community-based schools and segregated special schools for students with SEN, has continued within the Republic of Ireland as well. A government agency, the National Council for Special Education (NCSE) charged with administering education policy for this segment of the population, has advocated the continuation of the dual system, albeit with some reforms, citing the rights student with SEN to qualified teachers to meet

their specific needs (National Council for Special Education, 2013). This position may be seen as contrary to its expressed position on inclusive education:

To exclude a student because of a particular disabling condition is to diminish not only the student but also the enriched learning that can take place within the school community.

(Winter & O’Raw, 2010; p. 25)

However this duality within policy and agencies in these jurisdictions may well be the artifacts of the debate within the educational field around the issues of inclusive education and particularly what it is in practice (Fuchs et al. 2010).

5.4. Inclusion Debate

Inclusion of people with special educational needs, as well as other issues of diversity, within our societies has been viewed as a basic human right for many years (e.g. Salamanca Agreement, 1994; OECD, 1999). As a human rights issue, the philosophy of inclusion is unquestioned; garnering support in most developed countries of the world (e.g. the UK, Lindsay, 2007; Ireland, Shevlin et al., 2012; Italy, Paneri et al., 2009; the US, Harvey et al., 2010). This is not to say, however, that education experts or practitioners have moved this reform effort forward without divisive issues splitting opinion and research efforts in the field (Fuchs et al., 2010; Ravet, 2011). While there is little debate over the fundamental principles behind the inclusive education reforms of the past decades, consensus has not flourished beyond this central tenet.

Equality of opportunity and resources for optimal educational outcomes for members of society with diverse needs and experiences are democratic pillars of free nations across the globe (United Nations, 2006). The practical implications for these educational ideals are harder points on which to build consensus. What role, if any, does special education and special schools play in an inclusive education system (Fuchs et al., 2010; NCSE, 2009)? Is inclusive education an issue of human rights or individual needs (Ravet, 2011; Meegan & MacPhail, 2006)? And, is inclusive education an effective way of meeting the learning needs of all students in schools

(Lindsay, 2007; Fuchs et al., 2010; Ravet, 2011)? These questions may serve as a forward pointing roadmap for inclusive education in the 21st century, but a healthy debate of core issues will be required to eliminate philosophical confusion (Ainscow, 2005) and break the stalemate while moving educational reform forward (Lindsay, 2007).

5.4.1. Moderate-Inclusionists and Full-Inclusionists

While it may be accurate to argue that there is no support for the practice of exclusion in our education systems, it would be imprudent to imply that there is, therefore, universal agreement as to the structure of inclusive education (Cigman, 2007). In fact, despite an almost universal support for the philosophy of inclusion in our schools and communities, the manner in which inclusive theory is implemented has many variations so that inclusion in the US (United States Congress, 1997) will differ from inclusive education as practiced in Ireland (Government of Ireland, 2004). Differing positions regarding the means of accomplishing inclusion and the ultimate education system resulting from successful reforms, has created no less than two distinct perspectives on inclusive education (Lindsay, 2007).

With the null hypothesis having negligible support, research in the area of inclusion has come to be categorized into at least two philosophical perspectives. Radical or full inclusionists argue that all students have the right to an education in a mainstream classroom regardless of individual difference (Low, 2007) while those holding a position in support of moderate inclusion argue that the efficacy of educational placement requires both social acceptance of the pupil and measureable academic achievement (Cigman, 2007). There is a third philosophical stance presented in the literature, according to Cigman (2007). This group takes a centrist position when compared to the radical inclusion and moderate inclusion perspectives.

The moderate inclusion position is often referred to simply as inclusion and is contrasted to full inclusion position (Fuchs & Fuchs, 1998; Low, 2007). Inclusionists (i.e. moderates) see inclusive education as the ongoing process of reforming education settings to accommodate the presence, participation, and achievement of a range of diverse learners (Ainscow, 2005). Moderate goals align that with full inclusionists, that is, one education system featuring classrooms where all children of the community are educated together (Cigman, 2007). However, the recognition that inclusion is a process through which researchers and practitioners are working towards this end means inclusionists allow for the need for alternative placements for a small minority of students for whom the mainstream is unsuited (Low, 2007). The difference between full inclusionists and moderate inclusionists can be clarified by how each weighs a child's rights against the child's needs.

Low (2007) argues that the two groups give differing weight to the rights of the student to be educated in an inclusive environment and the student's right to an effective educational placement. Full inclusionists who see the right to an inclusive setting as paramount are at odds with moderates who argue that a placement needs first to be effective in educating the student before inclusiveness is considered (Fuchs & Fuchs, 1998).

The differing perspectives on inclusive education promote alternative practice in schools. Special education, as a service for addressing students' additional need in academic, social, behavioural, linguistic, and physical/sensory domains, would be transformed based on which of these perspectives is taken on as policy (Lindsay, 2007). From the UK perspective, this debate is pivotal in determination of the future role of the special school (Ainscow, 2007). Full inclusionists have called for the immediate closure of all special schools (Florian, 2010) as their availability provide a disincentive for reform of mainstream schools and the inclusion of all students (Low, 2007). Moderate inclusionists are of the view that they are engaged in a process of reform that will take time to perfect. Special placements are necessary on a very limited basis in order to provide services mainstream schools are failing to provide at this stage in the development of inclusive practice (Ainscow 2005; Cigman, 2007).

The role of special schools, in the moderate view of inclusion, is to provide effective learning environments for a small proportion of the SEN population that do not find mainstream settings effective learning environments (Lindsay, 2007). Additionally, these schools offer choice of education setting that endorse their priorities for social outcomes (e.g. peer group with similar interests and needs, low student to teacher ratio) as well as academic outcomes (Ravet, 2011). A continuum of inclusive educational placements should be available for the families of students with SEN to choose the best fit (Ware et al., 2009). The right to an inclusive education does not preclude the right to exercise other options based on individual needs such as effective learning environments (Low, 2007; Ravet, 2011).

Differences in educational placements are evident in comparisons between the US and UK. However, a similar legislative history regarding inclusive education has produced a debate in the US consistent to that of the UK. Because special schools are fewer in number and serve far fewer students with SEN in the US, the inclusive ideology debate has reflected on special education services (Lindsay, 2007). Special education in the US context is a parallel system of education collocated in mainstream schools, under common school administration, funded centrally from the same government sources, and often intermingled through inclusive practices for a segment of the SEN population (Fuchs, Fuchs, & Stecker, 2010).

Full inclusion would see the elimination of special education as a service provision to students while applying specific teaching techniques for students in need through expert co-teachers (Fuchs et al., 2010). Some researchers argue that general education teachers already have the skills needed to teach all student in the mainstream classroom but lack confidence in this ability (Florian & Linklater, 2010). According to Florian and Linklater (2010), addressing this deficit will allow for the special education system to be totally subsumed into one inclusive education system.

Moderate inclusive practice, on the other hand, makes room for special education services along the continuum of inclusion as individual needs dictate (Low, 2007). Under US legislation educational interventions are required to meet the standards of best practice (IDEA, 2004; NCLB, 2001) yet it must be recognized that not even empirically based procedures will benefit all students (Mitchell, 2008). Therefore there are students who will require remediation beyond in-class support (Fuchs et al. 2010). Teacher training in inclusive practices become important for both mainstream and special education placements (M. W. Harvey, Yssel, Bauserman, & Merbler, 2010) to fill the gaps that are inevitable.

5.5. Initial Teacher Education and Inclusion

Regardless of the ideological basis from which inclusive practice is implemented, there are issues that arise for initial teacher education (ITE) programmes as progress is made in the reform of education systems to advance inclusion. Inclusive pedagogy has an important role in teacher education presently and into the future (Florian & Linklater, 2010; Harvey et al., 2010). Inclusive education as a core component of ITE going forward is directly linked to the view of inclusion within the education system.

Moderate inclusionists, seeing a continued role for special educators in support of students with SEN and their mainstream colleagues, propose reform of the ITE system for general educators as well as those concentrating in SEN (Obiakor, Harris, Mutua, Rotatori, & Algozzine, 2012). Increased knowledge of SEN (e.g. characteristics of learning difficulties, effective strategies for teaching/ learning, assessment methods) is envisioned for future mainstream teachers (Obiakor et al., 2012; Ravet, 2011) while special educator training is viewed by some as unnecessarily reliant on pedagogy (Brownell et al., 2005) or in need of a positional shift towards co-operative specialist teaching (Hayes et al., 2013; Scheuermann et al., 2003).

Those who view special schools/ special education as an unnecessary dualistic system (Fuchs et al., 2010) perpetuating a culture of difference and inequality necessarily approach the training of future teachers in a manner different from the status quo. General education teachers will be required to address the learning needs of a widely diverse group of learners in their classrooms (Hart & Malian, 2013). Florian and Linklater (2010) contend that the mainstream teachers have the required skills for this task but need to apply these skills successfully in inclusive learning situations.

Some of the researchers who advocate for full inclusion argue that response to intervention (RTI) provides as an example of intervention strategies that will allow for the elimination of a separate special education services and the inclusion of diverse learners in the mainstream classroom (Fuchs et al., 2010). This three-tiered approach addresses the learning needs of all students within the support systems available in regular education settings. However, as Fuchs and colleagues (2010) argue, RTI has not been validated in curriculum content areas beyond reading and math as well as the likelihood that between 3-5% of students will require tertiary intervention. Under the RTI model, tier 3 is a one-to-one direct intervention model described as special education intervention (Fuchs et al., 2010).

An Australian study (Forlin & Chambers, 2011) found that despite extensive exposure to students with varying SEN, pre-service teachers reported increased stress when faced with teaching diverse groups in the mainstream classroom. These teachers, having had training experiences with students with SEN, were no more likely to be supportive of inclusive practices in this survey. In recent years ITE programmes have drawn scrutiny on several fronts, one of which is the training of teachers to work in inclusive settings (Brownell et al. 2005; Lambe, 2007; Clarke et al., 2012).

When considering inclusive education in schools, teacher education programmes for both general education teachers and special education teacher must be considered. The pre-service training experiences of those teachers expected to educate a diverse student population in mainstream classes will undoubtedly shape the abilities to deliver in this role (Forlin & Chambers, 2011), while special educators ability to adapt to new methods of service delivery (e.g. cooperative teaching, consultation, and delivery of professional development training opportunities), and possible intervention with non-traditional student groups (i.e. those without an SEN assessment; Florian, 2010).

Efficacy issues of ITE are not often the subjects of research efforts (Brownell et al., 2005). With the stipulation in the No Child Left Behind (NCLB, 2001) legislation, American schools are expected to employ highly effective teachers. Research into the elements of ITE and their impact on quality teaching in schools has become an imperative for the field (Harvey et al., 2010). This research indicated an increase in pre-service teacher exposure to special education courses and field experiences but optimism is guarded. Harvey and colleagues (2010) found special education/ inclusive education courses were rarely taught in collaboration across university departments with little course content input by an outside department (e.g. special education or elementary education). The majority of course work on collaborative practices in inclusive education were for future special education (70%) with few mainstream education students reporting similar coursework.

Through a meta-analysis of research documenting effective teacher education practices Brownell and colleagues (2010) emphasize carefully planned field experiences, cross-departmental and university to co-operating teacher collaboration, along with focus on inclusion and diversity, as core components of effective ITE programmes. With the emphasis currently on empirically measured student outcomes in primary and secondary schools, both in the US and UK, these authors, along with others (Fuchs, et al., 2010; Harvey et al., 2010) call for future research into the effectiveness of ITE based on learner outcomes (e.g. new teacher effectiveness in the classroom).

5.6. Inclusive Education and Students with Autism Spectrum Disorders

As with the general debate regarding the scope of inclusive education and the future role of special education services in such schools, educational placements and interventions for students with ASD are similarly varied (Ravet, 2011). Ravet (2011) contends that full inclusionists, through their insistence on the elimination of diagnostic labels and autism-specific pedagogies, effectively prohibit teachers from using empirically supported methodologies proven effective for students with ASD. Providing effective teaching methods for individuals with SEN while maintaining the inclusive philosophy adopted by national and local education authorities is much researched in the field of ASD education (National Research Council, 2001; National Standards Project, 2009).

An Italian study found an ASD specific approach to educational interventions more effective than inclusion with general SEN collaboration and, importantly, that this method (i.e. TEACCH, treatment and education of autistic and related handicapped children) was successfully applied in an inclusive classroom (Panerai et al., 2009). The use of specific methodologies for ASD may be problematic for those in support of full inclusion (Hart & Malian, 2013) and the limited role of special education services despite some evidence of their effectiveness in natural settings.

In a recent study, Hayes and partners (2013) report that despite mainstream teachers self-perception of adequate skills to teach students with ASD, they have little knowledge of crucial methodologies such as applied behaviour analysis which have been increasingly used with this student cohort. Training within SEN has been concentrated on general methods in order for these teachers to accommodate a wide range of student needs in an eclectic SEN class group (Scheuermann et al., 2003). According to Scheuermann and colleagues (2003), specific training is usually only offered as a result of a crisis where student regression has occurred. This study recommends intense ASD specific training for teachers who can then serve as leaders for ASD services within their school district.

Input from school district leaders regarding specific teacher qualifications for providing services to students with ASD was presented in a recent report (Hart & Malian, 2013). Based on increasing numbers of students with ASD and the likelihood that these student will be taught in mainstream classes for some portion of the school day, teacher preparation in ASD was viewed as critical by the respondents of this survey. Hart and Milian (2013) argue for mainstream teacher participation in ASD specific training although the workshop-method of delivering such content was criticized in this study. Although there was a call for ASD specific expertise through the individual state teacher certification system, Hart and Malian (2013) respondent preference was in favour of an endorsement for ASD as part of the SEN qualification required by the licensure body.

Specific training in the area of ASD for all teachers, whether enrolled in mainstream or special education programmes, has attracted support in the literature (Ravet, 2011; Hayes et al., 2013; Hart & Malian, 2013) despite the increased attention to inclusive education and opposition to labeling (Florian, 2010) and ASD specific pedagogies (Florian & Linklater, 2010). Ravet (2011) suggest teacher training in ASD specific methodologies, based on medical diagnosis of the condition, paves the way towards including more children with ASD in mainstream classes, as is the goal of all inclusionists. Integrating empirically based methods for teaching students with ASD in mainstream classes with specialist supports and classes for those who do not succeed in inclusive settings can advance the cause of including students with SEN while ensuring effective interventions and alternative placements based on student choice (von der Embse et al., 2011; Scheuermann et al., 2003; Ravet, 2011).

5.6.1. Inclusion of Students with ASD in the Irish Context

The history of inclusive education for SEN in Ireland is relatively short when viewed against other jurisdictions resulting in a culture of inclusion that is not fully established in Irish schools (Shevlin et al., 2012). While the Irish government issued legislation and policy reports broadly in support of inclusive education throughout

the 1990's (e.g. Report of the Special Education Review Committee, SERC Report, 1993; Education Act, 1998) support was maintained for the segregated system of special schools outside the mainstream education provision (Meegan & MacPhail, 2006).

It was not until the early years of the 21st century that inclusive practice began to be effected by legislation and judicial orders in support of inclusive education for students with SEN in Ireland (Supreme Court of Ireland, 2001; Education of Persons with Special Educational Needs, EPSEN Act 2004). A beneficial side effect of the late entry of Irish schools into the global trend towards inclusive education is the limited confusion around issues of terminology (i.e. integration versus inclusion; Meegan & MacPhail, 2006). Because of the heterogeneous make up of Irish society until recent years, inclusive education has always been viewed as a special education issue (Rose et al., 2010). Despite the near consensus over terminology of inclusion and the SEN focus of the reform efforts, inclusion in the Irish context has unresolved issues (Watson, 2009; Rose et al., 2010).

While legislation (EPSEN, 2004) and departmental policy (Department of Education and Science, 2007) support inclusive education for students with SEN, control of enrollment practices is held by local schools and principals (Watson, 2009) and result in different outcomes for students with SEN than those without disabilities. The non-enrollment of students with SEN is often legitimized through a concern for the expertise needed to provide effective education for the student (Shevlin et al., 2012) or because of a lack of appropriate resources being provided by the Department of Education (Watson, 2009).

Even at the government level the opt-out option is available to both the Minister for Education and the National Council for Special Education (NCSE) through language included in the EPSEN Act (2004) allowing non-provision of services based on lack of funding availability (Meegan & MacPhail, 2006). The Education of Persons with Special Educational Needs Act (2004), while lauded as progressing the inclusive

education agenda at the time of its enactment (Rose et al., 2010), has stalled in its implementation. Initial enactment was intended in stages, yet, as of the end of 2013, the complete system of supports (e.g. compulsory individual education plans for students with SEN) has not been implemented. In May 2013, the National Council for Special Education, a government funded support agency, called for full implementation of the EPSEN Act as soon as resources become available (NCSE, 2013). This inquiry comes as a new wave of reform begins within the Irish education system.

Initial teacher education programmes in the Republic of Ireland are drawing scrutiny regarding the preparation of teachers for inclusive schools (NCSE, 2013; Clarke et al., 2012). As Irish schools become increasingly inclusive of students with SEN they are drawing greater scrutiny over the academic achievement of their students (Conway & Murphy, 2013). The pressure of high stakes testing and reporting of academic achievement tables has influenced enrolment practices for students with learning disabilities and other SEN (Watson, 2009; NCSE, 2010).

Inclusive education will require increased training for mainstream teachers in special education pedagogy and include field experiences with the diverse populations expected in inclusive classrooms (Rose et al., 2010). At the same time, there is a call for the continued maintenance of a separate special school system with an increased role for specialized teachers in SEN (NCSE, 2009). In fact, the NCSE (2013) calls for improved SEN qualifications for mainstream teachers and the establishment of an additional category of special schools (e.g. special secondary schools) in the same document.

Concern is warranted regarding ITE for mainstream teachers in Ireland as it pertains to inclusive education. Current practice in Irish institutes of higher education require little formal, coordinated SEN training and no specific field experience with students with SEN (Shevlin et al., 2012). Future generations of Irish mainstream teachers will likely be the beneficiary of reforms announced recently by the Teaching Council of

Ireland (2013) yet the bigger concern will be the training of current teachers through in-career professional development (Rose et al., 2010).

Teachers having trained under the current ITE programme have expressed their own concerns with their lack of expertise and experience with students with SEN (Shevlin et al., 2012). Principals have reported denying enrolment to students with SEN based on the lack of teacher competence in the special methods required by some students (Watson, 2009). A survey of Irish secondary teachers reports respondents are confident in their abilities to include students with ASD (McGillicuddy & O'Donnell, 2013) despite this report also finding little evidence in these classrooms of appropriate accommodation for students with SEN (i.e. integration rather than inclusion).

While the NCSE (2013) and the Teaching Council of Ireland (2013) efforts to continue the reform of Irish education in line with inclusive practice are commendable, these efforts will only affect educational outcomes for students with and without SEN in the future (Shevlin et al., 2012). The largest impact on the student population in Ireland regarding inclusive education will be to provide quality, effective professional development in special education methods and accommodations to teachers in mainstream and special education settings (O'Gorman & Drudy, 2010) in conjunction with a revised SEN component to ITE (The Teaching Council of Ireland, 2011).

5.7. Initial Teacher Education and In-career Professional Development

While this section will focus on the changes to the education of teachers through initial teacher education (ITE) and continuous professional development (CPD), a third sub-category of training initiative exists in the Irish context (i.e. induction of newly qualified teachers). Induction is limited to the first year of a teacher's career (Conway et al., 2009). This topic is only briefly addressed in this chapter, as it does not directly pertain to the research presented.

The training of future educators generally is the remit of third level colleges of education in Ireland and globally (Conway et al., 2009). The process by which this is undertaken varies across nation-states as well as across institutions (Clarke et al., 2012). In many of these jurisdictions teacher education has been the subject of ongoing reform efforts for over a decade (Conway & Murphy, 2013). For example, in England, the National College for Teaching and Leadership (National College for Teaching and Leadership, 2014) monitors and enforces standards of professional practice for pre-service and early career teachers; while the General Teaching Council for Scotland, established in the 1960's, produced a standards document in 2006 as part of its role as an accreditation agency for initial teacher education (Conway et al., 2009). In the USA, the National Council for the Accreditation of Teacher Education (NCATE) was established in 1954 and but has is recently merged with the Teacher Education Accreditation Council in 2013 to form the Council for the Accreditation of Educator Preparation (CAEP), the sole accreditation body for teacher education in the US today (Council for the Accreditation of Educator Preparation, 2014). While individual States hold accreditation responsibilities of their own teacher colleges they are required to participate in the NCATE/CAEP's accreditation process (Johnson, Johnson, Farenga, & Ness, 2005). In Ireland, the Teaching Council of Ireland (2011) is responsible for the three 'I's: Initial teacher education (ITE), Induction training of newly qualified teachers (NQT) during their first year of practice, and In-career training, also called continuous professional development (CPD).

With the introduction of a new primary school curriculum in 1999, the Department of Education and Skills (DES) established a curriculum support agency with a remit to provide professional development activities around the implementation of the new curriculum (Egan, 2004). At this time CPD priority was given to the direct support of the introduction of the new curriculum with multiple bodies engaged in subject specific CPD delivery. More recently a shift to coordinate these supports occurred. The result of this reform was the creation of one agency, the Professional Development Service for Teachers (PDST), which provides professional development activities in all curriculum areas, information and communication

technologies (ICT), and school leadership for both primary and post-primary sectors (Banks & Smyth, 2011).

In accord with international research (Conway et al., 2009; Ball & Forzani, 2009), there is considerable recognition within Irish educational research (Coolahan, 2007; The Teaching Council of Ireland 2011; Clarke et al., 2012) of the need to create a more integrated system of teacher education that permeates the ‘three I’s’ (i.e. initial teacher education, induction training, and in-career training). While reforms based on the link between teacher training and student outcomes in the UK (Slater et al., 2009) and in the US (Cochran-Smith, 2005) have been advanced over recent decades, researchers within the Irish context highlight the need for implementation of reform policies on the part of government, as the march of progress seems to have slowed or even stalled (Coolahan, 2007; O’Gorman & Drudy, 2010).

5.7.1. Initial Teacher Education (ITE)

In an effort to improve educational outcomes for students in schools many jurisdictions have focused on revitalizing teacher education (Ball & Forzani, 2009). Although little research has addressed the issue directly, it is generally accepted that the quality of teachers in our schools is reflected in the measureable achievement of the school-aged populations, in other words the pupils (Slater et al., 2009). Teacher preparation programmes are predominantly the activity of third level colleges of education. These institutions have been subject to government scrutiny in an effort to add accountability to the process of preparing teachers for future generations (Conway et al., 2009).

Teacher training programmes are predominantly the activity of third level colleges of education. These institutions have been subject to government scrutiny in an effort to add accountability to the process of preparing teachers for the education of future generations (Conway et al., 2009). In the main, accountability has taken the form of accreditation procedures for ITE courses. It is only in recent years that many of the

States in the US have required participation in the NCATE/ CAEP accreditation system for its colleges of teacher education (Johnson et al., 2005). Formerly known as the Training and Development Agency, the recently formed National College for Teaching Leadership has responsibility for professional licensure of teachers and accrediting teacher training institutes in England (Conway et al., 2009; National College for Teaching and Leadership, 2014).

Alternative routes to teacher certification have existed in the US since the 1990's (US Department of Education, 2004) but have begun to attract greater attention and participant numbers in more recent years (Cochran-Smith, Piazza, & Power, 2013). The addition of alternative methods of entry into the teaching profession is seen as a means of attracting highly qualified individuals who may have had successful first careers in industry, higher education, or research (US Department of Education, 2004). Similar policy changes can be seen in the formation of the School Direct and Teach First programmes in England and Wales (Department for Education, 2014) as well as the accreditation of Hibernia College Dublin in the Republic of Ireland (Hibernia College Dublin, 2014).

Service learning in teacher preparation has been an important recent development in traditional training programmes for teacher education in the US (Darling-Hammond, 2010). As a form of experiential learning in the tradition of John Dewey (Dewey, 1916), clinical practice has a pivotal role throughout the entire teacher education programme beyond the traditional student teaching requirement as a culminating activity just prior certification (Darling-Hammond, 2010).

Added emphasis has been placed on the quality of ITE in the US through the requirement of highly qualified teachers in the No Child Left Behind legislation (US Government, 2002). Conway and Murphy (2013) have noted the increased emphasis on literacy and numeracy goals as a major contributory factor in the 'global education reform movement' (p.13). The desire to improve student performance on

high stakes exams is evident in league tables for GCSE results in the UK and US state achievement tests in the US (Conway et al. 2009; Conway & Murphy, 2013).

5.7.2. ITE in the Irish Context

Upon review of the history of Irish ITE system since the founding of the state nearly one hundred years ago, Coolahan (2007) recounts several reform movements occurring on a generational time schedule. The 1980's saw government pursue a number of regressive policies such as closing the largest of the colleges of education and putting a cap on the number of students participating in the programmes for the Higher Diploma in Education. A period of reform during the 1990's lead to several key research reports on the teacher education system in Ireland (e.g. OECD, 1991; Green Paper, 1992; White Paper, 1995). For example, the Green Paper (1992) sought to revamp initial teacher education in Ireland to provide for a core programme of teachers at all level, followed by area specialization leading to a bachelor's degree in education. Under this plan teachers would be required to continue with a postgraduate diploma course that included teacher practice. The White Paper (1995) included an in-depth discussion of a programme of induction for first-year teachers. This induction year, upon successful completion, would result in full certification for entry into the profession.

The Green Paper (1992) made considerable reference to the education provision of students with special educational needs. This report suggested a policy change from the establishment of special schools to inclusive mainstream education for students with milder forms of SEN and accommodations for these students to access third level education opportunities (Green Paper, 1992; section 2.7). Unlike the preceding paper that served as a review of current practice and potential reforms (Green Paper, 1992), the White Paper (1995) was a statement of government policy for future legislative and practical reforms of the education sector. The latter volume said very little about the education of students with SEN. In fact, one sentence was included indicating that SEN may be an area for potential teacher CPD. Even as a CPD topic,

SEN was not a top priority being mentioned sixth in a list of eight potential subjects for an increased CPD programme (White Paper, 1995; p 138-139).

In the years following the publication of these two key documents, the central focus of the Department of Education was the planning and implementation of a revised primary school curriculum (Coolahan, 2007). However, one notable reform occurred with the accreditation of an online Institute of Higher Education in 2000. Hibernia College Dublin was recognized, first by the Higher Education And Training Awards Council (Hibernia College Dublin, 2014) and later, after its creation in 2006, by the Teaching Council of Ireland (The Teaching Council of Ireland, 2014). The establishment of Teaching Council of Ireland (TCI) came a decade after the White Paper had recommended the establishment of a professional body for teacher certification (Conway & Murphy, 2013).

The Teaching Council of Ireland has been heralded as the harbinger of the revitalized effort to reform teacher education (Coolahan, 2007) and it has now undertaken the role of accreditation of ITE in Ireland (Conway & Murphy, 2013) through a five to seven year cycle of document review and observation by an accreditation panel (Teaching Council, 2011b). However, the reform efforts to date have been slow and have centered on the ITE and induction components of the continuum of teacher education (Conway et al., 2009).

The Teaching Council has set out to establish criteria for good teaching, promote teaching as a profession, and advance the public trust in that profession (O'Ruairc, 2013). One major plank in this platform is the development of a professional code of practice for teachers, which is to serve as a career guide in ethical practice for teachers, inform public expectations of the teaching profession, and serve as a legal basis for review of complaints of professional misconduct by members of the profession (Teaching Council, 2012). Although the code contains a major heading indicating required knowledge and competencies of member teachers, it also contains moral and professional values such as respecting uniqueness and being

committed to inclusive education with few examples of required teaching skills. Effective communication with students, parents and the school community and development of assessment procedures that aid in curriculum differentiation are notable exceptions to the general statements made such as maintaining high standards of practice and applying knowledge in aid of the holistic development of students. This volume does however impose a duty on each teacher to undertake professional development to maintain teaching skills throughout the career.

The Teaching Council is also responsible for college of education accreditation in Ireland. This activity is carried out by reviewing each training providers curriculum and course syllabi. A review panel consisting of seven members, several with expertise and experience of accreditation procedures outside of Ireland, is formed by the Teaching Council. The Teaching Council director or a designate of the director, a Teaching Council member, and a registered teacher are included in the review panel as well. The chair of the panel is specified to be an independent expert in teacher education from outside the Irish higher education system (Teaching Council, 2011b). At least two member of the review panel will conduct a three-day site visit that is scheduled at least six months in advance and following a preliminary meeting of all parties. The panel members will routinely meet with college administrators, faculty, and students. Recent graduates and partner schools where teaching practice takes place will also be consulted. Students past and present will be surveyed regarding their satisfaction of the programme. Panel members may also observe a lecture or tutorial session during site visits. By document review and review panel site visitations ITE programmes are identified as accredited, temporarily accredited awaiting revision of substandard criteria items (Teaching Council, 2011b).

This process is seen as an indirect measure of the professional preparedness of students of the ITE programme to enter the educational workforce (Conway & Murphy, 2013) as only qualitative responses from recent graduates speaks to the effectiveness of the programme. In contrast to the National Council for Accreditation of Teacher Education (NCATE) requirements of US colleges of education (Cochran-Smith, 2005), there is no requirement by the Teaching Council for the provision of

evidence of positive outcomes for the programme or its participants (Conway et al., 2009; Conway & Murphy, 2013) rather accreditation relies on ITE programmes providing curricular content that has received a satisfactory review by the review panel (Teaching Council, 2011b).

Conway and Murphy (2013) note the increased degree to which Irish schools are held to public account for student outcomes (i.e. results from state exams at second level and standardized test of numeracy and literacy at primary level). They also note with concern the prescriptive nature of the requirements of the accreditation process, particularly around literacy and numeracy, imposed by the Teaching Council. Conway and Murphy (2013) relate the new emphasis on learner outcomes in literacy and numeracy as a start down a slippery slope towards high-stakes testing of students embodied in the US reform campaign. Yet in the US the learner outcome expectations now associated with ITE accreditation have drawn support as well as criticism among academics.

Ball and Forzani (2009) propose a reform of ITE where students spend much more time teaching in peer groups, model classrooms, and local school classes at the expense of a lessened concentration on pedagogy. It is argued that this practice teaching will give students the skill required upon ITE completion. Some teacher education colleges have set up new programmes of extended learning for new and mid-career teachers (Darling-Hammond, 2005). Often these innovations include the establishment of professional development schools, providing cooperative sites for state of the art practice and training opportunities. Other positive outcomes have been noted such as: evidence gathered for accreditation being used by teacher educators to improve their own teaching methods, colleges of education are researching outcomes of their recent graduates to determine their job readiness upon programme completion, employment status, career path, and teacher educators, economist, and social scientist collaborating in multidisciplinary approach to research (Cochran-Smith, 2005). With the compulsion to provide evidence of learner outcomes, teachers and teacher educators are becoming researchers of their own practice.

Some troubling by-products to the current reform movement have also been presented in the literature. Research shows a failure of some schools to obtain acceptable test results being fully attributed to teacher quality while ignoring other social issues such as poverty, unequal funding, and poor facilities (Johnson et al., 2005). There is an almost exclusive reliance on student test performance as measure of effective teaching (Cochran-Smith, 2005). Underperforming schools and school systems tend to be found in economically deprived areas with lower levels of education funding and poorer facilities. These factors can create a problem for teacher retention where lower salaries and public scrutiny of learner outcomes drives quality teachers to better paid jobs in better performing suburban schools (Johnson et al., 2005; Cochran-Smith, 2005).

5.7.3. Special educational needs in Irish ITE

There is sparse research on the role of special educational needs within the curriculum of Irish ITE programmes; this may be due to the absence of a programme specifically for the qualification of teachers of SEN in the Irish ITE sector (O’Gorman & Drudy, 2010). The authors of this study emphasize that the only recognized qualification in SEN in Ireland is a one-year postgraduate diploma. The postgraduate diploma, however, is not compulsory even for those teachers employed in learning support, resource, or special needs classrooms in Ireland. There is no undergraduate degree programme to qualify teachers in SEN in the Republic of Ireland and the postgraduate programmes are not required for employment in SEN teaching posts. A majority of SEN teaching positions, including learning support, resource, and special classes are in the primary sector and only require a primary teacher qualification. Even special schools with students up to the age of 18 years require primary teacher qualification (O’Gorman & Drudy, 2010).

In the US teacher licensure is granted on a state-by-state basis. As an example, the state of Massachusetts, Department of Education, issues teacher certification in moderate disabilities, severe disabilities, deaf/ hard-of-hearing, early childhood:

students with or without disabilities. There are two separate age range qualifications for each category: pre-kindergarten to eighth grade (age equivalent to 3 to 14 years) or fifth grade to twelfth grade (age equivalent of 11 to 18 years). Additionally, licensure is offered as a specialist teacher in reading, advanced academics, and speech language and hearing disorders (Department of Education, State of Massachusetts, 2011).

State licensure in special educational needs generally requires completion of an approved ITE programme in the specific field of licensure requested, although alternative pathways have been developed recently (Cochran-Smith, 2005) which require entrants to meet the same requirement standards while not require formal participation in ITE programmes (Darling-Hammond, 2005). All entrants into the teaching profession in each state of the US must pass standardized examinations as evidence of competency (Cochran-Smith, 2005; Darling-Hammond, 2005).

US colleges of education offer degree courses in special educational needs as part of the teacher education role. As some states require a master's degree for full teacher certification (Department of Education, State of Massachusetts, 2011), ITE institutions may offer general teaching preparation as part of the undergraduate degree programme (University of Massachusetts at Boston, 2013). Other states issue full licensure to teachers holding an undergraduate degree in the specific area of certification and teacher colleges in these states tend to have programmes of bachelor's degrees to reflect this practice (Morehead State University, 2013). In all cases, however, teachers of students with special educational needs are required to have met the licensure qualifications of the granting state including, in most instances, a degree from an approved teacher-training provider.

Some ITE programmes however have SEN modules, although there is a great degree of variance in how the SEN content is delivered. In order to determine common practices and make recommendations to providers of ITE, a comparison study evaluated SEN teacher training in the Republic of Ireland and Northern Ireland.

Unlike their counterparts in the Republic of Ireland, ITE providers in Northern Ireland receive reports from the inspectorate on partnership schools that host teaching practice to evaluate the appropriateness of the pre-service experience undertaken by student teachers (Kearns & Shevlin, 2006).

Kearns and Shevlin (2006) used survey and focus group methodologies to conduct a review of SEN teacher education policies in both jurisdictions and established common components of SEN content in ITE programmes. In this study many participating ITE programmes stated the SEN content was diffused throughout the curriculum. Even though students encounter SEN and behaviour difficulties in placements during the initial phase of study, specific SEN content is not presented until the latter portion of the programme (Kearns & Shevlin, 2006).

Where they do exist, SEN modules are addressing the need for SEN knowledge to some extent. However, these modules have only been in place for the past decade while the majority of teachers in Irish classroom would have completed initial teacher education prior to their introduction (O’Gorman & Drudy, 2010). The absence of this specific training in SEN as a component of previous initial teacher education programmes makes the argument for increased professional development opportunities in special educational needs a priority for policy makers and CPD providers.

While it may be that Ireland has so far avoided the ‘outcome trap’, the practice of evaluating teacher education programmes only by the impact graduates have on student test scores (Cochran-Smith, 2005 p. 11), the reform efforts to date lead some investigators to point out potential for concern such as changed teachers work patterns due to requirements of NQT induction/ mentoring, decreased resources including fewer special needs assistants for a growing SEN population, heightened scrutiny of schools and colleges by central government through the new Teaching Council accreditation process, and evaluations based on high stakes testing of students during a time of financial restrictions and economic constriction(Conway &

Murphy, 2013). Other criticisms of the reform efforts in Ireland include the slow uptake by the government when commissioned reports (e.g. White Paper, 1995; Green Paper, 1992; OECD Report, 1991) offer recommendations, for example, to develop a system of regional boards of education to localize the administrative role currently held within the Department of Education and Skills (White Paper, 1995) or implementation of a national system of CPD for teachers (Green Paper, 1992; White Paper, 1995) and the disjointed approach taken to the three tiers of teacher education (Coolahan, 2007).

5.7.4. Induction

Initial teacher education is followed in Ireland by a period of induction for newly qualified teachers (NQT). At the time of his report, Coolahan (2007) considered induction as the weakest pillar of this continuum with as the then pilot programme had not been rolled out on a nationwide basis. Recently, however, the Teaching Council has begun requiring a course of workshops for NQT in the first years of teaching (Teaching Council of Ireland, 2011). Under this new induction programme, teachers have three years to complete a series of ten workshops as a requirement for continued employment as a teacher in Irish schools at primary and secondary levels.

International comparison shows many countries providing a reduced teaching load for NQT, additional resources for schools hiring NQT, and assignment of mentor teachers to guide the novice (Darling-Hammond, 2005). While the Teaching Council has expanded the pilot programme of induction to include all NQT, to date this course is an elective with which each NQT and school can chose to engage (Teaching Council, 2011).

5.7.5. Continuous Professional Development

Speck and Knipe (2005) provide a guide to essential elements for high quality professional development that would serve as a good guide in an effort to evaluate and reform teacher CPD.

A high quality programme of CPD for teachers must:

- be focused on improving student learning,
- assess the participants learning needs and set goals accordingly,
- promote professional growth through sustained, intense training activities over a multi-year period,
- evaluate progress by collecting and analyzing data that informs programme changes.

(Speck & Knipe, 2005 pp. 8-17)

With reform efforts underway in both ITE and induction programmes for NQT, many now recognize the need for advancement in the area of continuous professional development (CPD). In fact, the Code of Professional Conduct (Teaching Council of Ireland, 2012) emphasizes that it is the teachers duty to maintain high standards of professional knowledge and skills may actively participating in a career-long programme of professional development. Under the present regulations, CPD for Irish teachers in on a voluntary basis (O’Gorman & Drudy, 2010) and as such there are no minimum requirements of CPD for teachers. Teachers may undertake 20 hours of CPD during summer holidays, either by attendance at face to face or enrolment in online professional development courses sanctioned by the Department of Education. Evidence of participation in the shape of a certificate of completion is required of teachers who wish to avail of the three personal vacation days award for the CPD activity (Department of Education and Science, 1997).

5.7.6. International context

In a comparison of US professional development practices in education to those of other western nations, researchers argue supports for uptake of CPD are restrictive in the US system (Darling-Hammond, 2005). Many of the comparison countries in this report provide regular time for teacher collaboration around CPD, curriculum development, and observing other teachers while few US teachers engage in similar activities within school hours. New Zealand, for example supplies additional teachers to schools employing NQT in order to create free time for mentor teachers to observe and support their protégés. Japan provides school time for teachers to

collaborate with colleagues, visit other classes or schools, and conduct educational research (Darling-Hammond, 2005).

In planning and implementing professional development activities, Borko (2004) recommends that organizers engage in more complex analysis of outcomes including: teacher knowledge, change to teacher practice, change to teacher thinking, and affect on student learning (Borko, 2004). This ideal is contrary to the typical one-shot workshop approach currently employed in most US schools (Darling-Hammond, 2005). While the ultimate goal of professional development for teachers is the improved learning outcomes for their students, evidence based on data gathered throughout the process will help deliver these outcomes (Speck & Knipe, 2005).

High quality professional development is required to achieve real improved student learning. Avoiding a one size fits all approach to CPD by offering teachers choice and multiple levels of training is imperative to affect change with teachers based on their individual needs (Speck & Knipe, 2005). Intensity (i.e. providing multiple opportunities and methods sustained over time) and content that is focused on the everyday practice and specific subject matter of participants are key elements in this high quality approach (Borko, 2004; Kleiman, 2004; Speck & Knipe, 2005). Speck and Knipe (2005) expand on this element by suggesting the inclusion of new research and outside experts as a means of helping teachers evaluate their own practice and adapt new strategies to their own setting and teaching style.

As evidence of effectiveness is required by No Child Left Behind (2002) legislation use of the data collected to inform and revise teacher-training programmes is academically prudent (Cochran-Smith, 2005). Data collection must go beyond the simple evaluation exercise where participants indicate their satisfaction with a CPD course (Speck & Knipe, 2005). Collection and analysis of data relating to improved teacher knowledge, changed classroom practice, and ultimately, student performance outcomes should inform CPD plans for future content (Borko, 2004; Speck & Knipe,

2005). Effective evaluation of CPD bolsters support for the continued commitment of resources to in career training programmes by funding agencies as well as satisfying the demands of legislation (Speck & Knipe, 2005).

While further validation of the potential of eLearning approaches to CPD are needed, the value of this technology is worthy of consideration where resources are scant, target teacher populations are dispersed, and expert knowledge in requisite areas is not easily available. Irish teacher are expected to engage in meaningful, effective CPD throughout the career (Teaching Council, 2011) even when financial resources for CPD are shrinking, many teachers are hours from large population centres, and CPD offerings are limited (PricewaterhouseCoopers, 2012). In regions with dispersed populations, such as Ireland beyond the urban centres, it become uneconomical to provide CPD activities to small groups with travel expenses, facility hire, and presenter payroll (PricewaterhouseCooper, 2012). Extending CPD beyond introductory course to address highly specific or advanced topics reduces the potential audience numbers. This again becomes a financial burden when such CPD programmes are targeted at rural areas, as participant numbers are scarce.

Proponents of e-Learning platforms, widely used in ITE course in American universities, note the resource-saving element of this technology (Kleiman, 2004). eLearning technologies can be used to simulcast CPD courses to multiple locations by means of closed circuit television systems or be stored on the Internet for non-simultaneous access by participants from their home or school. Web-based teacher education modules, created by ITE providers, can serve as potent CPD opportunities for those in rural areas without a population base to sustain custom planned and delivered professional development. This use of technology can deliver high quality CPD in a more cost effective manner than live person-to-person presentation of courses to small groups.

Kleiman (2004) argues that online learning potentially has the elements necessary for high quality CPD (e.g. self-paced learning, intensive and sustainable over time,

multiple levels of complexity, and data driven). Evidence of the effective use of eLearning to teach a specific skill is available, for example a study involving the teaching of the principles and procedures of ABA showed only a slight advantage in post-test knowledge for the subjects who were taught in the traditional face to face manner compared to those using a web-based approach (Granpeesheh et al., 2010). Similar results were reported in research focused on teaching skills and knowledge required for The Early Start Denver Model, an educational approach drawing on the principles of behaviour analysis (Vismara et al., 2009).

5.7.7. CPD in the Irish Context

Research regarding continuous professional development for teachers in Ireland is scant. Many of the studies that do exist focus on satisfaction ratings of participants (Glenn et al., 2012; PricewaterhouseCooper, 2012) rather than learner outcomes as considered best practice (Speck & Knipe, 2005; Cochran-Smith, 2005). For example, Banks and Smyth (2011) compiled survey data on the uptake of CPD by teachers and the motivational factors that relate to individual participation. Among their finding they report that female teachers are more likely to participate in CPD than male teachers, and teachers who work with special needs assistants (SNA) are more likely than those who do not work closely with an SNA to be involved in CPD activities. Research has shown that the number of males entering the teaching profession in Ireland has been in steady decline over many years (INTO, 2004b), combining this with Banks and Smyth's (2011) finding that mid-career teachers are more likely to participate in CPD than those in the final stages of their career, it could be assumed that a large number of male teachers are to be found in the late-career group. Another finding by Banks and Smyth, those teaching in classrooms with special needs assistants are more likely to participate in CPD than those teachers who do not have this SEN resource, supports the finding in other research that SEN topics of CPD are the most sought after by Irish teachers. Those teachers with SNA in their classroom would have students with significant special needs by nature of the SNA allocation system (O'Gorman & Drudy, 2010).

Increased attention has been given to the structure of CPD delivery by the establishment of a support system scheme modeled on the Primary Curriculum Support Programme, developed in 1998 to aid the introduction of the new primary curriculum the following year. Under this structure, each support service is directed by a National Co-coordinator and managed by a steering committee. Training is carried out by a panel of facilitators usually made up of teachers seconded from their teaching posts (Egan, 2004; PricewaterhouseCooper, 2012).

The existing system of Education Centers, numbering 30 full and part-time centers, was co-opted as regional host sites for national support programmes. The Education Centers serve to organize, advertise, and administer courses for the national support services. Local Education Centres are also charged with meeting the specific professional development needs of its local catchment schools (Egan, 2004). The funding for professional development activities in the education sector is managed through the Teacher Education Section (TES) of the Department of Education and Skills.

Professional development courses provided by the DES support services receive low levels of scrutiny (Teaching Council, 2011) in contrast to those opportunities offered by third level institutions, such as. post-graduate diplomas, higher diplomas, and master of education degree programmes that undergo rigorous internal validation and external accreditation processes much the same as ITE programmes (Egan, 2004).

Multiple reports on CPD in Ireland have stress the need to base these training activities on evidenced-based practice (PricewaterhouseCooper, 2012; Teaching Council, 2011) yet there continues to be a heavy reliance on simple qualitative post-hoc evaluations from participants of CPD for teachers, often related to organizational rather than content issues (Egan, 2004). Teacher-participants attending CPD courses are asked to complete a voluntary feedback form requesting information limited to their perceptions of the organization, venue, speaker, or training activities and the likelihood of the course changing their teaching methods and potential student

achievement (PricewaterhouseCooper, 2012). The authors of this report acknowledged the lack of data available on change in student outcomes or teacher use of new skill/ knowledge in their school as a result of CPD activity necessitated their use of teacher perception findings throughout this survey.

5.7.8. Special Educational Needs Professional Development in Ireland

Specific research on the in-career training opportunities for teachers within the content area of special educational needs (SEN) is limited in the Irish context. General reports on CPD in Ireland fail to address the area of SEN in any meaningful way: Teaching Council, 2011; Conway & Murphy, 2013; Coolahan, 2007; Conway et al, 2009 focus on the elements of the continuum of teacher education (i.e. initial, induction, and in-career) without any consideration of specific topics including SEN while Egan (2004) notes the existence of CPD in SEN as a priority area as evidenced by the development of a support service for SEN and Banks and Smyth (2011) present survey evidence showing that many teachers are motivated to participate in CPD due to the presence of students with SEN in their classroom.

Prioritization of SEN in Ireland, either in terms of CPD or budgetary support, is proposed by Egan (2004) yet O’Gorman and Drudy (2010) counter that SEN focus in Irish ITE programmes is minimalized thus requiring NQT and experienced teachers alike to seek CPD on basic SEN information and strategies. Since most SEN content in the primary and post-primary qualification programmes and postgraduate work in SEN being strictly voluntary (Kearns & Shevlin, 2006) the need for professional development in SEN for mid-career teachers is paramount. In a survey of 642 Irish SEN teachers, O’Gorman and Drudy (2010) found the most common topic sought by respondents in a CPD course was basic information about types of SEN. The researchers attributed this need to the lack of SEN preparation received by many Irish teachers as part of their ITE programme.

Provision for CPD has been largely the remit of a support service established to plan, develop, and implement training in the area of special educational needs (Egan, 2004). At the time of its inception, the Special Education Support Service (SESS) was developed with the same hierarchical structure as other education support services in Ireland (e.g. Primary Curriculum Support Programme, Second Level Support Service, and Leadership Development for Schools) with a National Coordinator, a steering committee, and seconded teacher/ trainers. While a majority of the teacher supports services have been recently subsumed into an overall CPD provider (i.e. Professional Development Service for Teachers), the SESS has been maintained as a separate organization (PDST, 2013).

5.7.9. Special Education Support Service

The Special Education Support Service (SESS) was established in 2003 by the Department of Education and Skills as a national provider of CPD for teachers in primary, secondary, and special schools in Ireland. Its goal is to improve teaching and learning for those engaged in special needs education at all levels through training opportunities for schools and individual teachers. The SESS does not work directly with students but may consult on individual cases as the need arises (SESS, 2013).

Budgetary control over the SESS resides within the Teacher Education Section of the DES, which is responsible for all activities of initial teacher education, teacher induction, and teacher CPD. The overall TES budget had seen a funding increase from 1997-2003 by 265% from €10.8 million to €28.7 million (Egan, 2004). These figures represent policy/funding decisions during a time of economic boom in Ireland and must be viewed in this light. The post-economic crisis of 2008 figures for SESS funding, nevertheless indicate a decrease in allocation over the period 2007-2010 with funding dropping from €3.2 million to €2.0 million. This figure is augmented by the fact that all salaries, except those of the small administrative and clerical staff, are paid separately and directly by the DES. After the administrative costs, the SESS spends 93% of its funding on programme development and presentation (PricewaterhouseCooper, 2012). In light of the direct expenditure of

SESS funding on CPD support programmes, the recent reduced budgets paired with increased need for CPD in SEN (O’Gorman & Drudy, 2010) will result in further stretching of limited resources (PricewaterhouseCooper, 2012).

Although not specifically initiated as a cost effectiveness analysis, the Teacher Education Section (TES) of the DES commissioned an evaluation of the SESS and the efficaciousness of its delivery of CPD in special education to teachers in Ireland. This commenced in 2010 and culminated with the publication of its final report: An Evaluation of the Special Education Support Service, in March 2012 (PricewaterhouseCooper, 2012). High rates of SESS awareness (82%) and participation in SESS training courses (47%), use of online support, and access of website (56%) were reported. These rates were highest among those teachers working in special schools or in learning support/ resource teaching roles.

The researchers provide a caution in interpreting these survey results. Four surveys were mailed to each of 1000 randomly selected schools across the primary, post-primary, and special school sectors. This mailing included instruction to disseminate the survey to teachers with experience of SESS support or having taught students with SEN (PricewaterhouseCooper, 2012). The data collected may well have emanated from a higher proportion of the former group creating a response bias on survey items such as awareness of the SESS or use of its resources.

The PricewaterhouseCooper (2012) report deals extensively with the effect of SESS CPD on the classroom practice of participants and the outcomes for their students. Seventy percent of respondents report that SESS training has impacted their teaching practice to a significant degree. In addition, 58% of survey respondents agreed that the training has improved the academic achievement of the students in the classroom. These results should be interpreted cautiously as they are self-reported responses to survey items and are not backed by independent data to support the view of the respondent. Empirical data were not collected on any aspect of the evaluation both due to time constraints and the absence of a database of evidence of student

outcomes as a result of teacher CPD participation. As a result, survey findings were drawn from data on teacher perceptions of gains in student performance or change in classroom practice as a result of accessing SESS support (PricewaterhouseCooper, 2012).

Current practice in the SESS is to monitor CPD efficacy through an informal process of training evaluation forms (PricewaterhouseCooper, 2012). These forms ask participants rate the course content and structure, facilitator, and venue on a Likert-type satisfaction scale on an anonymous and voluntary basis. The standard individual forms are processed into a composite evaluation form that is forwarded to the TES (Egan, 2004). Participant satisfaction input such as this is of minimal value when compared to empirical outcomes (Speck & Knipe, 2005). Increased participant knowledge or change in classroom practice is considered greater evidence of CPD effectiveness (Cochran-Smith, 2005) and a sound basis for CPD development and revision (Borko, 2004). Data collection including participant pre-test/ post-test results can demonstrate effectiveness of CPD activities and add to the quality assurance process.

The nature of CPD provision in Ireland, and by the SESS specifically, can be enhanced to account for participant learning needs and individual goals (PricewaterhouseCooper, 2012). Respondents indicated in this survey that some needs, namely those of experienced teachers, were not being met by one-off introductory level seminars. Sustained intense programmes of CPD can help teachers improve skills, increase knowledge base while directly affecting student learning outcomes through a multi-year process (Speck & Knipe, 2005). Local professional development communities can help create the sustained learning opportunities to bring about these goals (Borko, 2004).

An interesting response was given by a segment of a focus group when asked about CPD in the absence of the SESS programme of training. Many respondents suggest they would have participated in third level SEN postgraduate programmes as a

means of professional development had the SESS not been available. The college of education postgraduate courses referred to have an advantage over the CPD training offered by the SESS in that the former are accredited by the Teaching Council (Egan, 2004) and the latter are not accredited at all. Egan (2004) concluded that an increase in teacher uptake of postgraduate programmes through third level institutions, often at the teacher's own expense, is evidence of the support for accredited CPD for teachers in Ireland. As a guide to future policy regarding teacher CPD, the Teaching Council has proposed that CPD completion become part of the renewal of licensure process and that CPD courses undertaken should be counted towards additional qualification for participants (Teaching Council, 2011).

If implemented as proposed in the policy statement, teacher CPD programmes would include accountability procedures such as individual participation records and data collection of learner outcomes (Egan, 2004) as part of an accreditation process in line with that applied to ITE programmes (Teaching Council, 2011). This process is likely to decentralize the provision of CPD as it moves from national programmes delivered on a large scale by national providers such as the SESS (PricewaterhouseCooper, 2012) to local school/ school cluster driven model with access to national services as required (Teaching Council, 2011).

5.7.10. Conclusion

Continuous professional development for Irish teachers has made great strides towards a coherent and effective model of teacher education (Coolahan, 2007) yet there is important work to do in the future regarding accreditation and accountability for CPD (Teaching Council, 2011). Developing teacher CPD that is student learning centered, based on participants needs, sustained over several years, and informed by data collection and analysis (Speck & Knipe, 2005) would serve as a good guide as these changes are made. This set of criteria, when applied to the SESS programme, highlights some of the areas for future consideration in advancing SEN professional development for Irish teachers.

A key element missing across the SESS programme of CPD is data collection. Current practice within the organization does not facilitate the collection of data to track CPD activities of specific schools or individuals (PricewaterhouseCooper, 2012) and there is no data available regarding the effectiveness of training programmes, outside of the participant satisfaction forms. Procedures to test knowledge of participants prior to and following CPD would serve to determine effectiveness of materials and activities, school-based follow up to CPD participation can provide data on procedural changes in classrooms, and student probes can be used to test the effect of training on student achievement (Borko, 2004).

Future changes to the CPD system in Irish education are imminent and teachers will be held accountable for CPD participation (Teaching Council, 2011). This higher level of accountability needs to be applied to the providers of CPD to assure the quality of training for participants required to satisfy the proposed standards. Collecting, analyzing, and utilizing data to determine programme effectiveness are necessary activities to assure cost effective expenditure in time of economic pressures (Borko, 2004). ‘We can no longer afford professional development activities that do not have measureable results’ (Speck & Knipe, 2005; p. 128). This is a salient thought as The Teaching Council (2011) hopes to bring ‘innovation, integration, and improvement’ (p.22) to the teaching profession in Ireland.

6. Methodology

6.1. Introduction

The initial research plan included a professional development module covering basic information about ASD, challenging behaviour, and ABA. A pre-test and post-test was to be administered to all participants to ascertain learning outcomes and empirically validate the method and content of the training module as an example of good practice for CPD for teachers.

It became evident that access to a significant number of teachers of students with ASD was going to present problems. Additionally, the ability to carry out follow up meetings to administer post intervention testing was beyond the capacity of the researcher due to time constraints and budgetary restrictions. The decision was made in light of these factors to administer a knowledge assessment that collected data on CPD provided by existing resources available to teachers in the Republic of Ireland in the areas of ASD, CB, and ABA.

CPD activities provided by the Department of Education and Skills through the SESS had an additional benefit to the current research in that the content of these modules was validated by the government agency responsible for education policy and practice in the Republic of Ireland (Price, Waterhouse, & Coopers, LLB, 2012). While this may not be equivalent to empirical validation, the authoritative position of this source makes its view definitive within this context.

6.2. Ethics

The Ethics Committee of Queen's University Belfast approved this research project. Research participants were education professionals in the Republic of Ireland who worked directly with students assessed as having an autism spectrum disorder (ASD). Informed consent was obtained for each individual participant as described below.

6.3. Procedure

Participation for the pilot survey was limited to a convenience sample of the target population. Participants were recruited for the pilot from attendees at a course on behavioural approaches to ASD. These teachers were asked to participate and received an information leaflet with details outlining the purpose of the pilot, the researchers contact information and a weblink to access the survey. The online survey was the only method of data collection for the pilot survey.

The researcher was a participant on this course and was known professionally to some of the other participants but anonymity was maintained throughout this process as the internet survey did not require participants to give their name or other identifying information. Of the total sample pool ($n=30$, approximately) seven responses to the pilot were recorded. As there was no method to follow up the initial request for participation, no further contact was made with the sample pool. After a prolonged collection phase, it was determined that no additional responses were likely to be obtained so data collection was closed after one month.

For the main survey instrument, potential participants were presented with an information page and consent form on the initial page of both the written and online version of the survey. This page included a statement of withdrawal from the study without prejudice (Appendix 1). Contact details for the researcher, for use should any questions or issues arise, was also included. The online version of the questionnaire allowed only those agreeing to participate to proceed to the first section of the survey while those who refused consent were thanked for their interest and automatically exited from the survey site. Those opting to receive the printed version of the survey were required to manually tick a box indicating affirmation or negation of consent. No respondent indicated in the negative for consent while continuing to supply responses to the questionnaire. One case of consent refusal was recorded through the web-based form and no further responses were collected from this subject.

Anonymity was maintained throughout this study. No identifying information was requested on either the paper version or the internet version of the survey. The online survey platform recorded internet provider (IP) addresses for the computer of origin for all electronic responses but these are not necessarily linked to the individual respondent nor is it within the researcher's ability or intent to identify respondents through this data.

In order to reach a significant response rate, two modes of survey completion were developed. With an internet-based survey developed using the SurveyMonkey platform, a print version was created duplicating the layout, style and order of the original online survey.

Survey hardcopies and web link information were distributed to teachers attending several training events held during one week in May 2012. The total number of teachers attending the three courses in question was 210. During a brief address to the course attendees, the purpose of the research project and the participation methods available were detailed for attendees. Those who indicated an interest were given the option of completing a paper survey or the online version by means of a web link. Of the 150 hardcopies of the survey distributed, there was a return rate of 55.3% (n=83). Many others opted to take the information sheet for online completion of the survey. Unknown quantities of these handouts were distributed. Eighty-eight responses were obtained through the combination of these methods.

An email campaign was initiated to provide more responses to this survey. The National Council of Special Education (NCSE) has published a list of special classes for students with ASD attached to mainstream schools, dated November 2011, on their website (www.ncse.ie). This was downloaded on May 2, 2012. Email addresses for these schools were obtained by a web search of school websites and a data collection website focusing on school information (www.schools.ie). This process was replicated for the lists of special schools with ASD specific classes and a group of 12 pilot schools (formerly known as Applied Behaviour Analysis schools).

These lists were sourced on February 3, 2011 from the NCSE report: The future role of special schools and classes in Ireland (Ware et al., 2009).

In total 238 emails containing researcher identification, purpose of the study, request for participation and a survey link were sent to schools on this compiled list. The general email address of the school was used and as no individual teachers were identified, the school was requested to forward the information to the teachers of students with ASD. One hundred and forty-one primary schools, 57 secondary schools, 29 special schools and 11 former ABA schools were included in this email campaign. Of the total (n=238), approximately 15 emails were returned as undeliverable to the researcher with 11 remaining undeliverable after follow-up search for accurate email addresses. Because many of these schools have multiple eligible teachers, the number of potential participants reached through this method is undetermined. However, an additional 77 responses were obtained following this effort with an end total response of 166 participants, including one reply of non-consent. Of the 165 valid responses, approximately 53% were returned as hardcopy version while 47% were completed online.

The principal researcher is a teacher of students with special educational needs in the Republic of Ireland and is likely to have a professional relationship with some of the respondents. This was unlikely to cause any conflict of interest as the data obtained from all respondents is anonymous even to the researcher since no identifying information was required for participation in the survey.

6.4. Participants

6.4.1. Age of respondents

Of the 166 respondents, 152 indicated their current age at time of survey by selecting one of four age range categories (91.6% response rate). Fourteen participants provided no response to this item. The same number of missing values occurs for all seven demographic items in the survey (e.g. n=14).

The majority of respondents indicated their age as between 30-39 years (38.8%) with the fewest responses in the 50 and over category (17.1%). Other categories reported as follows: 20-29 years (23%), 40-49 years (21.1%). As these responses were indicated for age range categories no mean age is reported.

6.4.2. Gender of participants

The gender of participants was reported in 152 of the 166 cases. Females represented 83.6% of the sample, while males made up the remaining 16.4%. The predominance of females in this survey may be directly related to the low number of men in the primary education sector in general (17.5%; Irish National Teachers Organization, 2004b).

6.4.3. Location of employment

The participants were asked to indicate the geographic location of the school in which they are teaching by selecting one of 29 options provided. These options included all 26 counties in the Republic of Ireland plus separate items for three of the larger urban areas (i.e. Dublin city, Cork city and Limerick city). While all geographic areas were represented in the survey sample, two locations had the high rate of response: counties Kerry and Kildare each had 17 survey participants. Each of these countries represented 10.2% of the overall respondents.

The response rate was improved in Co. Kerry possibly as a direct result of the delivering hardcopies of the survey and collecting them the following day for attendees at a professional development training session. While Co. Kildare was not visited in this manner for survey distribution, a training session in a bordering county was included with a number of participants attending from Co. Kildare.

6.4.4. Setting of respondent teaching environment

This survey item gave participants an opportunity to indicate the type of school, level of school (i.e. primary or secondary), and classroom setting of their current teaching role. The options given were representative of the settings in which students with ASD and/ or challenging behaviour are learning. Special class in a primary school, mainstream classroom in a primary school and resource class in a primary were the junior level options. Similarly, senior level teachers could choose: special class in a secondary school, resource class in a secondary school, or mainstream class in a secondary school. In addition to these placements, teachers also represented special schools and ABA schools (technically, former ABA schools recognized by the Department of Education and Skills as pilot schools).

The single most popular response on this item indicated 21.7% of teachers were currently working in special classes attached to primary schools. Teachers from special schools and resource teachers in primary schools had the next highest frequencies with 18.7% and 16.9% respectively.

Table 1: participant place of employment by education sector

Education Sector	Percent of participants
Primary	48.8
Secondary	21
Special Schools	18.7
ABA (Pilot) Schools	3

- **Table 1:** Percent of 166 responses with 8.4% providing no response

6.4.5. Overall teaching experience

In order to determine how long each respondent was employed in the education sector, they were asked to choose a range of experience in years teaching for all

levels and content areas including SEN. Almost 44% of teachers reported having more than 10 years experience in the field.

Table 2: Participant total career teaching experience

Teaching experience (all areas)	Percent of participants
First year	3
2-5 years	19.3
6-10 years	25.3
11-15 years	11.4
16+ years	32.5

Table 2: *Percent of 166 responses with 8.4% providing no response

6.4.6. Research Tools

A pilot survey was developed to test questions and responses for validity to research objectives, response range and survey completion times. The pilot contained mixed mode questions including open response, multiple choice and true-false questions appearing in random sequence. In addition, this pilot survey acted as a trial for the online data collection format as this was a novel medium for the researcher.

The pilot survey consisted of participation consent form. Demographic information, a history of professional development undertaken and planned for the future, and knowledge questions followed by a brief case study. There were nine questions on the subject of general ASD information. Ten questions were asked regarding challenging behaviour. And another ten questions were posed on the topic of applied behavior analysis (ABA).

The main research tool, entitled *Survey on Autism and Challenging Behaviour*, was developed as an online survey questionnaire on Survey Monkey (www.surveymonkey.com). This online platform allowed a variety of questions formats including multiple choice, openended and true/ false constructs. Online responses were collected through an internet interface which allows anonymity for participants. Editorial access to the survey questionnaire was maintained by the researcher through account security. Online participation in the survey was limited to those having the unique web address for this survey and required agreement to a statement identifying the subject as a target population member and the above mentioned participation consent. To the best of the researchers knowledge, the link in question was not discoverable through random web searches or a search of the Survey Monkey website.

Survey questions were grouped into four general areas. Demographic information was requested including age, gender, level of education, teaching environment, teaching experience and student population served. Further survey questions targeted the training received by respondents the topics of: ASD, challenging behaviour, applied behaviour analysis, and functional behavioral assessment.

The main part of the questionnaire reflected the respondent level of knowledge of key issues in ASD, challenging behaviour and ABA. Nine or ten items probed the respondent's understanding of these areas of special education using multiple formats. The questions, developed by the researcher, ranged from introductory information to more advanced ideas on the subject matter. This issue directly corresponds to the research questions addressed here:

- Does participation in professional development have an affect on teacher knowledge in the areas of autism spectrum disorders (ASD), challenging behaviours (CB), and applied behaviour analysis (ABA)?

And to a lesser extent:

- Does self-reported knowledge of each domain (ASD, CB, ABA) correspond to the knowledge question outcomes for teachers indicating good understanding and poor understanding

Finally, a case vignette was presented that described a scenario in which a student with an ASD exhibits a behaviour which severely limits his access to educational activities. The respondents were asked to present a hypothetical process for dealing effectively with this situation. The amount of detail included was left to each respondent to determine. This survey item was openended and consisted of an expandable text box in the internet version of the survey and $\frac{3}{4}$ of an A4 sheet in the print edition.

One significant difference in the survey presentation methods did exist. While the written version of the survey allowed the respondent to skip ahead and return later to complete skipped items, the online version did not allow this facility. Once the participant progressed to the next page they were not able to revert back previous pages. Editorial changes to responses were also affected by this system constraint. Only those working with the paper version were free to return to previous answers in order to alter responses. This inconsistency was not the design of the researcher but a product of survey websites construct.

6.4.7 Questionnaire development

The survey instrument was developed by the researcher for the purpose of this study. It was decided to construct a questionnaire suited to the goals of the present research rather than adapt one or several existing measurement tools. This decision was made as the researcher was familiar with the training programmes available to the target population and was in a position to construct a device suited to the task. Several existing surveys would likely have been required to meet the goal of querying teachers in the areas of autism spectrum disorders, challenging behaviour, and applied behaviour analysis. In hind sight, use of existing instruments may have improved the validity of the research results through the established reliability and validity data.

The survey was presented in a test format familiar to teachers. The question type was varied between true/false, multiple choice, and short answer open ended questions. The researcher inspected the correct answer data to avoid the establishment of a pattern that would allow for incidental correct answers being chosen by respondents who perceived the pattern.

This methodology was chosen rather than the use of Likert-type scales based on the professional familiarity teachers have with these question types. While Likert-type scales are useful beyond satisfaction and attitudinal data, it is this type of research that the method is most directly associated with. In retrospect, Likert-type scales would have been easily adapted to several of the survey items but adaptation throughout would have proven more difficult. As the early plan for this research called for a pre-test post-test instrument, the researcher developed the survey instrument in the style of a typical classroom assessment used by the target population on a daily basis.

7. Results

7.1. Introduction

The objectives of this research was to determine the content specific knowledge of teachers of students with ASD in the Republic of Ireland in the areas of ASD, challenging behaviours, and applied behaviour analysis, and to compare the knowledge of those reporting participation in professional development in the specific areas assessed. Despite the limited research based on educational practices in Ireland, particularly in the area of special educational needs, the findings of this research will be addressed in light of current literature in the field. While this research has produced many significant findings worthy of discussion, the current focus will be those findings that are most pertinent to the literature on current practices in education of students with ASD. Other findings from this research may be included in similar studies in the future.

Key findings from this research have been determined in light of the following developments:

- The latest prevalence rates for ASD have been estimated as 1:88 births and 1:54 male births (CDC, 2012).
- Inclusive education policies have resulted in more students with ASD being educated in mainstream classrooms by regular education teachers (National Council for Special Education, 2013)
- Autism spectrum disorders are a complex continuum of learning needs (Task Group on Autism, 2002; The Task Force on Autism, 2001) and teaching students in this population require highly skilled and knowledgeable professionals (Hayes, Casey, Williamson, Black, & Winsor, 2013; Shyman, 2012).
- Interventions based on applied behaviour analysis have been empirically shown to be effective in improving outcomes for people with ASD (Dawson et al., 2010; Fein et al., 2013).

This research does not support the initial hypothesis that respondent participation in SESS professional development would affect teacher knowledge in the content areas (i.e. autism spectrum disorders, challenging behaviour, and applied behaviour analysis). Selected findings will be presented to illustrate this fact.

The analysis of the current research focused on the teachers reported prior professional development or third level training in each of the content areas under investigation. These groups were label as 'SESS' for those participants receiving CPD with this provider and 'other' for the teachers who indicate training through another source (e.g. third level courses, outside provider training, in-school peer lead training). A substantial number of responses were coded as 'none' in terms of relevant CPD, these responses either indicated 'none' or similar in response to this survey item or left the item blank.

7.2. Length of teaching experience

Among the demographic information gathered on research participants in this study, years of teaching experience provided an interesting result in terms of training experience. More than 35% of those providing feedback for this item indicate they have more than sixteen years in the teaching profession. By adding to this percentage those indicating between 11-15 years of teaching, nearly half (48%) of survey respondents have been in the field for more than ten years. This is significant when the history of Irish teacher preparation programmes is considered. ITE in Ireland has only required any coursework in special or inclusive education within the past decade (O'Gorman & Drudy, 2010). Thus it could be interpreted from the survey response that a large portion of this sample has had insufficient training in the education methodologies appropriate for use with students with SEN during the undergraduate degree programme. Limited pre-service exposure to SEN pedagogy would increase the likely need for CPD in this area throughout the career and could adversely affect inclusive practice in Irish school (Shevlin, Winter, & Flynn, 2012).

Despite the overall experience level of this cohort, the vast majority of these participants (62%) have five or fewer years working with students on the autism spectrum. Teacher knowledge of characteristics of ASD is an important indicator of successful interventions in schools (Hart & Malian, 2013; Shyman, 2012) and extends beyond the general SEN knowledge that should be an integral part of ITE (Florian, 2010). The relative inexperience of the ASD teacher contingent creates greater pressure for intensive, effective in-career training (Speck & Knipe, 2005).

Participants were asked to indicate the overall length of their teaching experience (in years) at all levels and with all student populations. A set of response categories was provided (i.e. first year, 2-5 years, 6-10 years, 11-15 years, and 16+ years).

Table 3 shows that the vast majority of participants had substantial teaching experience. In fact, the most frequent response was ‘16+ years’ with nearly one-third of all participants indicating very substantial teaching experience. First year teachers represented only a very small number (3%) of the overall sample, while 8.4% of participants did not provide information about length of teaching experience.

Table 3: Overall Length of Teaching Experience

Years in teaching	Frequency	Percent
First year	5	3.0
2-5 years	32	19.3
6-10 years	42	25.3
11-15 years	19	12.5
16+ years	54	32.5
No response	14	8.4

7.3. Length of ASD teaching experience

Participants were asked about the length of their teaching experience (in years) with students with a diagnosis of autism spectrum disorders. Response categories were provided for intervals of first year, 2-5 years, 6-10 years, 11-15 years, and 16+ years.

Table 4 shows that experience of teaching students with ASD was substantially shorter than overall teaching experience. While most of the participants (43.4%) had 2-5 years teaching experience with students with ASD, only 8.8% (n=7) had 11 or more years experience with this population. Again, 8.4% (n=14) did not respond.

Table 4: Length of experience teaching students with ASD

Years teaching ASD	Frequency	Percentage
First year	31	18.7
2-5 years	72	43.4
6-10 years	31	18.7
11-15 years	7	4.2
16+ years	11	6.6
No response	14	8.4

7.4. Self-reported knowledge of subject matter

Respondents were requested to rate their own understanding of specified topics within special educational needs. These topics were autism spectrum disorders (ASD), challenging behaviour (CB), applied behaviour analysis (ABA), and functional behavioural assessment (FBA). Each of the questions presented four

options for response: very little (knowledge), somewhat (knowledgeable), good (knowledge), and very good (knowledge).

Self-reported knowledge in the four key areas is presented in **Table 5**. As might be expected among a cohort of designated teachers of students with ASD (i.e. designated by the SESS for inclusion in all professional development activities in the area of ASD) self-report of knowledge of autism was high. More than 2/3 of the respondents rated their knowledge in this area as good or very good. Conversely only 20% reported having some or little understanding of the field of ASD education. Similarly, most of the teachers thought that they had good or very good knowledge regarding challenging behavior (62%), while only few thought that they had little or only some knowledge in regard to ASD (20.5%) and CB (24.1%).

The reverse was true with regard to knowledge in ABA and Functional Behavioural Assessment. Most of the respondents felt that they had very little or only some knowledge of ABA (50%) and FBA (50.9%) and only few thought that they had good or very good knowledge in ABA (29.2%) and FBA (22.3%). Fewer than a quarter of respondents have confidence in their proficiency in the process recommended for intervening with challenging behaviour by the SESS (O'Leary, 2011) and for students with ASD (O'Reilly et al., 2010) whose behaviour excess and deficits have a detrimental effect of social educational outcomes.

Table 5: Self-reported knowledge of autism spectrum disorders (ASD), challenging behaviors (CB), applied behavior analysis (ABA), and functional behavioral assessment (FBA).

	ASD	CB	ABA	FBA
	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)
Very little	3 (1.8)	4 (2.4)	50 (30.1)	71 (42.8)

Somewhat	31 (18.7)	36 (21.7)	33 (19.9)	30 (18.1)
Good	48 (28.9)	61 (36.7)	33 (19.9)	28 (16.9)
Very good	63 (38)	42 (25.3)	26 (15.7)	12 (7.2)
No response	21 (12.7)	23 (13.9)	24 (14.5)	25 (15.1)

7.5. Continuing professional development (CPD)

During a teaching career, training opportunities are provided and encouraged in order to enhance instructional skills and pedagogical knowledge. The training of professionals during their employment is often referred to as continuing professional development (CPD; Price Waterhouse Cooper, 2012). Teachers were asked to indicate the number of days on which they were engaged in CPD over the school year 2011-2012. Responses were provided by 117 (70.4%) participants and showed a mean number of 5.82 CPC days with a standard deviation of 6.18.

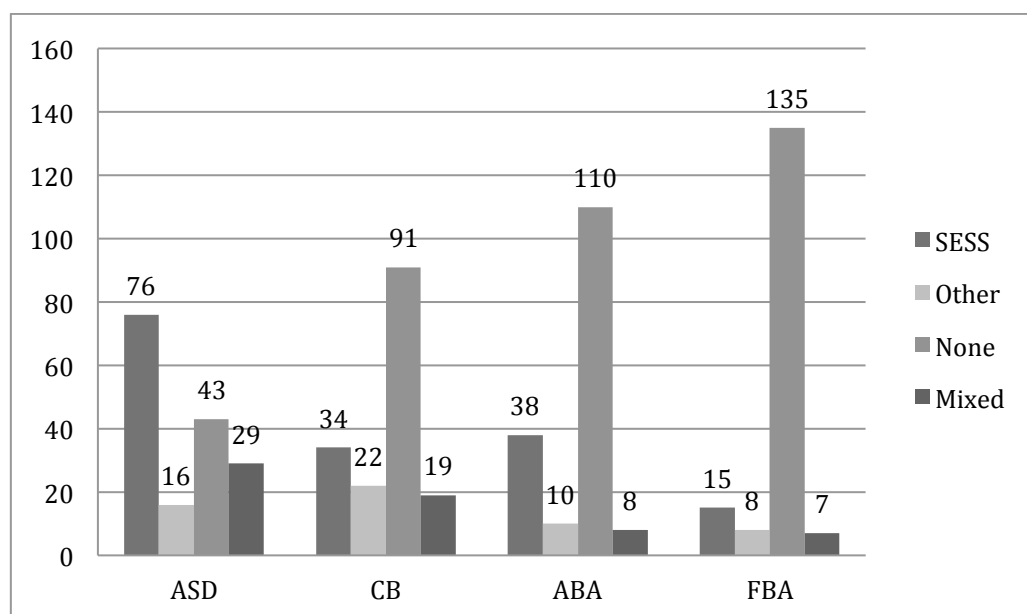
7.6. Provider of continuing professional development

Respondents were asked to identify the source of training in four areas: autism spectrum disorders, challenging behaviours, applied behaviour analysis, and functional behavioural assessment. Multiple entries were allowed on this item (e.g. a respondent could indicate both a third level training provider and a CPD provider). The majority of CPD in special education is provided by one organization sanctioned and funded by the Irish government through the Department of Education and Skills (DES). This provider is the Special Education Support Service (SESS).

Figure 1 shows the frequency of training providers grouped by domain area for the SESS, other providers, no training, and mixed training provider groups. The SESS group are responses indicating only SESS training in the content area while other

refers to responses indicating training by any other sources not the SESS. Mixed training group consists of responses indicating two or more sources of training in a content area (i.e. SESS & third level, other CPD and SESS). The no training group consists of the survey participants that left CPD provider information blank or indicated no training was completed for the content area. Although FBA training data is provided in Figure 1, data was not gathered on this topic as a separate content area but was included in overall ABA knowledge items. Therefore the FBA training provider data is not analyzed further.

Figure 1: Frequency of responses for training provider by content area



7.7. Knowledge with Regard to Autism Spectrum Disorders

In as much as teaching students with ASD was the main focus of this study, respondent knowledge of autism spectrum disorders (ASD) was the initial area of investigation. While more than two-thirds of the teachers surveyed reported a good level of understanding for the content area of ASD, the rate of correct response does not support this rating. The teachers with training in the area of ASD through the SESS recorded more correct responses in the area but this was only slightly more than half of the items answered correctly. Participants in the current research report greater knowledge of ASD than supported by the evidence of this survey.

Participants in the current research indicate high levels of SESS CPD participation across the content areas under investigation. Of those respondents who indicated having prior CPD experience in the area of ASD, nearly 80% attended training in this area through the SESS. Among these teachers, 63% report their only professional development related to autism was through this provider. Less than one-quarter of the teachers had experienced professional development sessions provided by other sources according to the current research. This may be due to the extensive programme of CPD directed at the population of teachers working with students with ASD (Special Education Support Service, 2014b).

In total, nine items appeared in this section with multiple formats included (e.g. multiple choice, true/false, and open ended response). Question topics were varied in complexity in order to probe the depth of participant subject knowledge. Responses were recorded in two categories: correct and incorrect replies.

7.7.1. Knowledge of Triad of Impairments

In order to assess participants' knowledge of the triad of impairments, that was commonly used under DSM-IV as a basis of diagnosis, the following open ended question was posed: *The 'triad of impairments' in ASD consists of social interaction, communication, and...*

The correct answer, according to the literature (Wing & Gould, 1979; DSM IV –TR, 2000) was 'imagination'. Variations such as 'social imagination' and 'imaginative play' were accepted as correct responses. This question and acceptable correct response was accurate at time of research under the then current edition of the American Psychiatric Association publication, Diagnostic and Statistical Manual, Fourth Edition, Text Revised (2000). The recently published update to this manual (DSM5, 2013) was not available during the data collection phase of this study.

Table 6 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in ASD from other sources.

Table 6: Knowledge of Triad of Impairments by training provider

	No training	SESS	Other training	Total
Incorrect Responses	39 90.7%	61 78.2%	9 56.2%	109 79.6%
Correct Responses	4 9.3%	17 21.8%	7 43.8%	28 20.4%
Total	43 100%	78 100%	16 100%	137 100%

The relationship between correct responses for SESS and other training provider was not significant. The Chi-Square value 3.36 had an associated probability value of ($p=0.067$, $Df=1$).

Although all groups registered low levels of correct responses, the survey participants with training experiences with providers other than the SESS had the highest percentage of correct responses. Those teachers with no training in the area of ASD fared poorly with less than one in ten answering correctly. The SESS group score the second highest rate correct but this rate was only half that of the other training group.

7.7.2. Rise in prevalence of Autism Spectrum Disorders

In order to assess participants' knowledge of rise in prevalence rates of ASD the following true/ false question was posed: *The perceived rise in prevalence of ASD has been scientifically linked to environmental factors.*

The correct answer for this item was 'false' with research indicating multiple factors (e.g. increasingly sensitive diagnostic protocols, greater public/ professional awareness of ASD symptomology, and inclusion of broader subcategories within the ASD diagnostic category; Fombonne, 2003).

Table 7 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in ASD from other sources.

Table 7: Knowledge of prevalence factors by training provider

	No training	SESS	Other training	Total
Incorrect	29	23	4	56
Responses	67.4%	29.5%	25.0%	40.9%
Correct	14	55	12	81
Responses	32.6%	70.5%	75.0%	59.1%
Total	43	78	16	137
	100%	100%	100%	100%

The relationship between correct responses for SESS and other training providers was not significant. Since 25% of cells had an expected frequency of less than 5, the appropriate statistical test was Fisher's Exact Probability ($p = 1.000$ for a two-tailed test).

Again on this survey item the highest rate of correct responses was the group in receipt of other provider training with three out of every four answering correctly. The SESS group followed closely with seven of every ten correct. The group having no ASD training had just less than 1/3 answering correctly.

7.7.3. Causal links to ASD

In order to assess the participants' understanding of the current research in the causal factors associated with ASD the following question was asked: *Many researchers have concluded that ASD are 'multifactorial disorder. The factors that cause ASD are linked to... ethnicity and socio-economic background, multiple genes and unknown environmental factors, or poor parental bonding and a non-stimulating environment.*

The correct answer is: *multiple genes and unknown environmental factors*. While the causes of autism are still unknown, research has made progress in determining the genetic agents in a small fraction of instances of the disorder (Pickler & Elias, 2009). When factoring the evidence of an increased prevalence among monozygotic twins (Bailey et al., 1995) there is support for a genetic source for ASD. However, also stemming from the study of familial prevalence (Fombonne, 2005) it has been argued that genetics cannot be the sole cause since both monozygotic twins are not always affected with autism. Environmental facts, still unknown, are suspected to be the cause of this anomaly (Stratheam, 2009).

It is important that teachers of students with ASD are aware of the current state of the aetiological research in this field. Parents of children with ASD often look to professionals for information regarding the disorder as well as other professionals who only occasionally work with children on the spectrum. Having up to date

knowledge of the literature for ASD is a sign of professionalism in the education of students with ASD.

Table 8 compares the accuracy of responses for those indicating no training, training provided by the SESS, and those receiving training by other providers for ASD.

Table 8: Knowledge of the causal links to ASD

	No training	SESS	Other training	Total
Incorrect	26	7	3	36
Responses	60.5%	9.0%	18.8%	26.3%
Correct	17	71	13	101
Responses	39.5%	91.0%	81.3%	73.7
Total	43	78	16	137
	100%	100%	100%	100%

The difference between correct responses for SESS and other training was not significant. Since 25% of cells had an expected frequency of less than 5, the appropriate statistical test was Fisher's Exact Probability ($p = .366$ for a two-sided test).

The SESS group had the highest rate of correct responses to this survey item with 91%. The other training groups registered over 81% correct responses on this item while less than 40% of the no training group answered the item correctly.

7.7.4. Onset age of autistic disorder

In order to assess participants' knowledge of the age of onset of autism that were commonly used under DSM-IV as a basis of diagnosis the following multiple choice question was posed: *According to DSM-IV and ICD-10 the criteria for 'autistic disorder' has an onset age of: 12 months, 24 months, or 36 months.*

According to the American Psychological Association's Diagnostic and Statistics Manual, Fourth Edition Text Revised (2000) and the World Health Organization's International Classification of Disease, Tenth Edition (1990) the onset age for autistic disorder must be prior to 36 months.

Table 9 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in ASD from other sources.

Table 9: Knowledge of age of onset by training provider

	No training	SESS	Other training	Total
Incorrect	40	62	14	116
Responses	93.0%	79.5%	87.5%	84.7%
Correct	3	16	2	21
Responses	7.0%	20.5%	12.5%	15.3%
Total	43	78	16	137
	100%	100%	100%	100%

The relationship between correct responses for SESS and other training was not significant. Since 25% of cells had an expected frequency of less than 5, the appropriate statistical test was Fisher's Exact Probability ($p = .728$ for a two-sided test).

The group reporting SESS CPD answered correctly 1/5 of the time and had the highest success rate on this item. The group with other CPD was second best performers on this item with a correct rate of only 12.5%. The no training teachers were correct on this item only 7% of the time.

7.7.5. Impairments through the lifespan

In order to assess participants' knowledge of the impairments manifesting throughout the lifespan the following true/ false question was posed: *ASD are considered a developmental disorder because the impairments manifest during childhood then remain fixed throughout the lifespan.*

This statement is 'false'. Although classified as a developmental disorder (DSM-IV-TR, 2000) and manifestation originates in childhood, impairments associated with ASD have been remediated through educational intervention to varying degrees (Lovaas et al. 1987; Eikeseth et al. 2007). These impairments are not necessarily fixed throughout the lifespan, as new skills are acquirable. DSM-IV-TR (2000) was the current edition of this manual during the research period with the updated version (DSM 5; 2013) was published following data collection.

Table 10 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in ASD from other sources.

Table 10: Knowledge of impairments through the lifespan by training provider

	No training	SESS	Other training	Total
Incorrect Responses	32 74.4%	50 64.1%	11 68.7%	93 67.9%
Correct Responses	11 25.6%	28 35.9%	5 31.3%	44 32.1%
Total	43 100%	78 100%	16 100%	137 100%

The relationship between correct responses for SESS and other training provider was not significant. The Chi-Square value .126 had an associated probability value of ($p=0.723$, $Df=1$), showing that an association was unlikely to have arisen as a result of sampling error.

The lowest success rate for this survey item was just over 25% by the participants with no training in ASD. The highest correct response rate was the SESS group with nearly 36%, followed by the other training group with 32%.

7.7.6. Asperger's syndrome/ disorder

In order to assess the participants' knowledge of the subcategories of ASD the following question was presented: *Asperger's syndrome, as a sub-group of ASD, is often used synonymously with the term...*

The correct answer is 'high functioning autism' or HFA. Although the latest edition of the DSM (DSM5; American Psychiatric Association, 2013) has eliminated the

subcategories of Asperger's and PDD-NOS due to confusion differentiating categories for diagnosis (Frazier et al., 2012) there will continue to be people with ASD and their families who will use these terms into the future (Wallis, 2009). Familiarity with the nomenclature is essential for those working in the field.

Table 11 compares the accuracy of responses of those indicating no training, those having SESS training, and those having training in ASD by other providers.

Table 11: Knowledge of Asperger's syndrome/ disorder by training provider

	No training	SESS	Other training	Total
Incorrect	39	44	11	94
Responses	90.7%	56.4%	68.8%	68.6%
Correct	4	34	5	43
Responses	9.3%	43.6%	31.3%	31.4%
Total	43	78	16	137
	100%	100%	100%	100%

The relationship between correct responses for SESS and other training provider was not significant. The Chi-Square value .000 had an associated probability value of ($p=0.991$, $Df=1$), showing that an association was unlikely to have arisen as a result of sampling error.

The SESS training group had the highest rate of correct responses with nearly 44% answering correctly. The teachers with training from other providers answered correctly over 31% of the time, while the group with no ASD training reported less than 10% correct answers to this item.

7.7.7. Autistic features and the Triad of Impairments

In order to assess participants' knowledge of the triad of impairments that were commonly used under DSM-IV as a basis of diagnosis the following true/ false question was posed: *A child described as having 'autistic features' because they meet the criterion of only one of the triad impairments would not be diagnosed with an ASD.*

This statement is 'true'. According to the DSM-IV-TR (2000) and ICD-10 (1990), in order for a diagnosis of ASD the individual must present with featured characteristics in at least two of the three domain areas (also know as the triad of impairments). At the time of research DSM-IV-TR (2000) was the current edition of this manual. The recently revised edition, DSM5 (2013) was not available during the collection of data.

Table 12 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in ASD from other sources.

Table 12: Knowledge of autistic features and the triad of impairments by training providers

	No training	SESS	Other training	Total
Incorrect	30	26	8	64
Responses	69.8%	33.3%	50.0%	46.7%
Correct	13	52	8	73
Responses	30.2%	66.7%	50.0%	53.3%
Total	43	78	16	137
	100%	100%	100%	100%

The relationship between correct responses for the SESS and other training provider was not significant. The Chi-Square value 1.597 had an associated probability value of ($p=0.206$, $Df=1$), showing that an association was unlikely to have arisen as a result of sampling error.

The SESS trained group recorded a 2/3 correct response rate on this item with the other trained group registering half of its responses correctly. The group with no training answered correctly just over 30% of the time.

7.7.8. Prevalence rates of Autism Spectrum Disorders among females

In order to assess participants' knowledge of the prevalence rate of ASD among females the following open-ended question was posed: *According to generally accepted prevalence rates, in a group of 100 people with ASD, what number of these would be female?*

The generally accepted ratio of males to females diagnosed with ASD is 4:1 (Yeargin-Allsopp et al., 2003; Fombonne, 2005). Accordingly, the correct response for this question was '20'. Any expression of this ratio was accepted as correct (e.g. 1 in 5, 20% or 1:4) and the range for acceptable responses of ± 3 , making the numerical response 17-23 equivalent to a correct response.

Table 13 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in ASD from other sources.

Table 13: Knowledge of prevalence of ASD among females by training provider

	No training	SESS	Other training	Total
Incorrect Responses	40 93.0%	66 84.6%	11 68.8%	117 85.4%
Correct Responses	3 7.0%	12 15.4%	5 31.3%	20 14.6%
Total	47 100%	78 100%	16 100%	137 100%

The relationship between correct responses for SESS and other training provider was not significant. The Chi-Square value 2.256 had an associated probability value of ($p=0.133$, $Df=1$), showing that an association was unlikely to have arisen as a result of sampling error.

The teachers with training by other providers responded correctly to this survey item over 31% of the time while SESS trained responders only tallied 15.4% correct. The no training group had the lowest correct response rate at 7%.

7.7.9. Communication skills and stress

In order to assess participants' knowledge of the communication impairment the following true/ false question was posed: *A student with an ASD who has verbal abilities may still require communication aides under certain circumstances, such as stress.*

This statement is ‘true’. Even those individuals with a diagnosis of ASD who regularly use speech to communicate can require augmented systems at certain times. These may be times of elevated stress, sensory overstimulation, or transitions. Language skills may be diminished under circumstances particular to the individual (Howlin, 1998).

Table 14 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in ASD from other sources.

Table 14: Knowledge of communicative skills by training provider

	No training	SESS	Other training	Total
Incorrect Responses	25 58.1%	4 5.1%	0 0.0%	29 21.2%
Correct responses	18 41.9%	74 94.5%	16 100.0%	108 78.8%
Total	43 100%	78 100%	16 100%	137 100%

The relationship between correct responses for SESS and other training provider was not significant. The Chi-Square value 1.597 had an associated probability value of ($p=0.206$, $Df=1$), showing that an association was unlikely to have arisen as a result of sampling error.

Correct response rate for the other training provider groups was 100% for this item while the SESS training group posted 94.5% correct responses, and the group with no ASD training has a correct response rate of 42% for this survey item..

7.7.10. Section Summary

In sum, with regard to knowledge of ASD respondents were placed in the group having participated in professional development provided by the SESS (n=78) and other training provision (n=16). Respondents who reported no prior training in the area of ASD by leaving provider information blank or recording 'none' (n=43) were not included in statistical analysis. However, these results are reported for the purpose of comparison.

The mean number of correct answers (out of 9) for the SESS group was 4.60 compared to 4.69 for the other provider cohort and 2.02 for those with no training in the area of ASD. However, with a Cronbach's Alpha of .283, the series of survey items presented in the section for knowledge of ASD is not reliable as a scale measurement, therefore, comparison of mean scores is not recommended. A minimum Cronbach's Alpha of .7 would indicate that the items represented a true measure of knowledge of ASD. Under these circumstances, t-tests and ANOVAs are not necessary for this data.

7.8. Knowledge Regarding Challenging Behaviour

Challenging behavior occurs relatively frequently in pupils with Autism Spectrum Disorders (ASD) and constitutes a barrier to inclusion in schools. When the subject of challenging behaviour is addressed in the literature, it is regularly reported as a highly sought after CPD topic for teachers and school administrators (Banks & Smyth, 2011; Kelly et al., 2007). However, in the current research the number of teachers having participated in no CPD on challenging behaviour was twice that of ASD (i.e. n=91 for the former, n=43 for the latter). Although the majority of teachers (approximately 60%) have received support from the SESS, there is a smaller gap between this group and the over 40% having receiving training through other providers.

In total, ten topics related to challenging behaviours were investigated using a variety of response formats. Question topics were varied in complexity in order to probe the depth of participant's knowledge of this subject. Responses were recoded in two categories: correct and incorrect replies.

7.8.1. Setting Specific Challenging Behaviour

In order to assess participants' knowledge of the social and environmental context of challenging behaviour the following true/ false question was posed: *A behaviour can be determined to be challenging based on its inappropriateness in one setting.*

This statement is 'true'. Emerson (2001) defines challenging behaviour through a social context. The inappropriateness of behaviour is related to the rules and expectations governing the particular setting. Behaviours deemed socially acceptable in one setting may adversely affect individual inclusion in another setting. Conversely, a behaviour may be deemed challenging in only one setting yet seriously diminish the individual's quality of life, use of community facilities, and increase safety concerns (Emerson, 2001).

Table 15 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in CB from other sources.

Table 15: Knowledge of setting specific challenging behaviours by training provider

	No training	SESS	Other training	Total
Incorrect Responses	51 56.0%	16 47.1%	11 50.0%	78 53.1%
Correct Response	40 44.0%	18 52.9%	11 50.0%	69 46.9%
Total	91 100%	34 100%	22 100%	147 100%

The relationship between correct responses for SESS and other training provider was not significant. The Chi-Square value .046 had an associated probability value of ($p=0.830$, $Df=1$), showing that an association was unlikely to have arisen as a result of sampling error.

Respondents with training with other providers recorded a 50% correct response rate with those in the SESS training group doing slightly better at 53% correct responses and those with no training in CB doing less well with 44% correct responses.

7.8.2. Definition of Challenging Behaviour

In order to assess participants' knowledge of the definition of challenging behaviour following multiple choice question was posed: *A behaviour may be challenging if it is likely to involve a significant risk to people's physical wellbeing or to markedly reduce: the effectiveness of carers/ teachers, access to community facilities, or compliance to stated institution/ school rules.*

The correct answer is ‘access to community facilities’. In contrast to a topographical definition of challenging behaviour (i.e. a list of specific behaviours deemed inappropriate), an operational definition allows individual behaviours to be classified as challenging or otherwise while noting environmental factors and the role of other actors (Emerson, 1995). This definition is more inclusive than a topographical list and it acknowledges the impact of challenging behaviour on the individual, other persons, and the community (Oliver et al., 2003).

Table 16 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in CB from other sources.

Table 16: Knowledge of the definition of challenging behavior by training provider

	No training	SESS	Other training	Total
Incorrect	75	26	13	114
Responses	82.4%	76.5%	59.1%	77.6%
Correct	16	8	9	33
Responses	17.6%	23.5%	40.9%	22.4%
Total	91	34	22	147
	100%	100%	100%	100%

The relationship between correct responses for SESS and other training provider was not significant. The Chi-Square value 1.908 had an associated probability value of ($p=0.167$, $Df=1$), showing that an association was unlikely to have arisen as a result of sampling error.

With 41% correct responses to this survey item, the participants with training with other providers had the highest correct response rate. Less than a quarter of the SESS training group posted correct responses to this item while those with no training responded correctly 17.6%.

7.8.3. Prevalence of Challenging Behaviours

In order to assess the participants understanding of the rate of challenging behaviour occurring in an SEN population the following was asked: *Numerous researchers have reported a prevalence of challenging behaviour in a population of people with intellectual disabilities as... about 7%, about 15%, or about 22%. The correct as is about 7%.*

Table 17 compares the accuracy of responses for those indicating no training, training provided by the SESS, and those receiving CB training from other sources.

Table 17: Prevalence rate for CB in people with intellectual disabilities

	No training	SESS	Other training	Total
Incorrect	83	30	20	133
Responses	91.2%	88.2%	90.9%	90.5%
Correct	8	4	2	14
Responses	8.8%	11.8%	9.1%	9.5%
Total	91	34	22	147
	100%	100%	100%	100%

The relationship between correct responses for SESS and other training was not significant. Since 25% of cells had an expected frequency of less than 5, the appropriate statistical test was Fisher's Exact Probability ($p = .734$ for a two-sided test).

Correct response rate for all groups was very low with the SESS group answering correctly just fewer than 12%. Only about 9% of both the other training and no training groups answered correctly with 9.1% and 8.8% respectively.

7.8.4. Passive Behaviours that Challenge

In order to assess participants' knowledge of behaviours that challenging, including passive ones, the following open ended question was posed: *An example of a passive behaviour which can be challenging in many settings is...*

There were numerous possible correct answers for this item. The response must have been publicly observable behaviour (i.e. as apposed to private behaviours such as a mood or attitude) and it must have been 'passive' (i.e. require little or no effort by the student). Some examples were non-compliance, selective mutism, and avoidance (e.g. avoiding eye to eye contact). Responses were coded as correct or incorrect.

Table 18 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in CB from other sources.

Table 18: Knowledge of passive behaviours that challenge by training provider

	No training	SESS	Other training	Total
Incorrect Responses	75 82.4%	22 64.7%	15 68.2%	112 76.2%
Correct Responses	16 17.6%	12 35.3%	7 31.8%	35 23.8%
Total	91 100%	34 100%	22 100%	147 100%

The relationship between correct responses for the SESS and other training provider was not significant. The Chi-Square value 0.072 had an associated probability value of ($p=0.788$, $Df=1$), showing that an association was unlikely to have arisen as a result of sampling error.

The lowest correct response rate was recorded for the group with no training in CB with 17.6%. The group with training through other sources was next with a correct response rate of 31.8% and the SESS training group posted a correct response rate of 35.3% for this item.

7.8.5. Established Behaviours and Change

In order to assess participants' knowledge of changing long established behaviours the following true/ false question was posed: *A challenging behaviour that is in a person's repertoire for a long time is equally amenable to change as a newer behaviour.*

This statement is ‘false’. Each behaviour has a history of reinforcement causing its occurrence to be strengthened over time (Cooper et al., 2007). Generally, the longer a behavior has been reinforced the harder it is to alter, especially if the reinforcement history includes intermittent reinforcer delivery.

Table 19 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in CB from other sources.

Table 19: Knowledge of established behaviour amenability to change by training provider

	No training	SESS	Other training	Total
Incorrect	65	23	8	96
Responses	71.4%	67.6%	36.4%	65.3%
Correct	26	11	14	51
Responses	28.6%	32.4%	63.6%	34.7%
Total	91	34	22	147
	100%	100%	100%	100%

The relationship between correct responses for SESS and other training provider was significant. The Chi-Square value 5.290 had an associated probability value of ($p=0.021$, $Df=1$), showing that an association was unlikely to have arisen as a result of sampling error.

The difference between the rate of correct responses for the other training provider group and SESS training group was significant with 64% and 32% correct responses respectively. The participant with no training had a lower rate of correct responses at 29%.

7.8.6. Common Self-Injurious Behaviour

In order to assess participants' knowledge of self-injurious behaviours that occur commonly the following open-ended question was posed: *An example of a self-injurious behaviour that is NOT generally considered to be challenging is...*

Possible correct responses included: biting fingernails, tattooing, ear piercing, and scratching insect bites until they bleed. This list is not exhaustive and all examples were accepted that fulfilled the following criteria: the response had to refer to a public behavior (or product of behaviour) rather than a private behavior such as a mood or state of mind, the public behaviour resulted in physical harm to self rather than others, and the activity did not result in a behavioural intervention in general social settings such as community, school, or home. Responses were coded as 'correct' or 'incorrect'.

Table 20 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in CB from other sources.

Table 20: Knowledge of common self-injurious behaviour by training provider

	No training	SESS	Other training	Total
Incorrect	88	32	21	141
Responses	96.7%	94.1%	95.5%	95.9%
Correct	3	2	1	6
Responses	3.3%	5.9%	4.5%	4.1%
Total	91	34	22	147
	100%	100%	100%	100%

The relationship between correct responses for SESS and other training providers was not significant. Since 50% of cells had an expected frequency of less than 5, the appropriate statistical test was Fisher's Exact Probability ($p = 1.00$ for a two-sided test).

No group had a correct response rate above 6% for this survey item. The SESS training groups responded correctly 5.9%, other training group responded correctly 4.5%, and the group with no CB training recorded only 3.3% correct responses.

7.8.7. Variation of behaviour

To assess the participants' understanding of the variable nature of behaviour the following question was posed: *A behaviour, including challenging ones, can vary... over time, across setting, in intensity, or all of the above.* The correct answer is *all of the above.*

Table 21 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in CB from other sources.

Table 21: Knowledge of variation of behaviour by training provider

	No training	SESS	Other training	Total
Incorrect	36	8	4	48
Responses	39.6%	23.5%	18.2%	32.7%
Correct	55	26	18	99
Responses	60.4%	76.5%	81.8%	67.3%
Total	91	34	22	147
	100%	100%	100%	100%

The relationship between correct responses for SESS and other training providers was not significant. Since 25% of cells had an expected frequency of less than 5, the appropriate statistical test was Fisher's Exact Probability ($p = .746$ for a two-sided test).

With high correct response rates for all groups, the other training provider group responded correctly nearly 82%, SESS training group 77%, and the group with no training in CB recorded 60% correct responses to this survey item.

7.8.8. Behavioural Function and Intervention

In order to assess participants' knowledge of the role of behavioural function in intervention the following true/ false question was posed: *A behavioural approach to challenging behaviour utilizes the function of the behaviour to increase the likelihood of a successful intervention.*

This statement is true. Behaviour analysis determines the function of behaviour through functional assessment or functional analysis procedures and utilizes this information to determine the best intervention strategy to replace the challenging behaviour with a socially relevant alternative target behaviour (Cooper, et al. 2007). Responses were coded true: correct and false: incorrect.

Table 22 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in CB from other sources.

Table 22: Knowledge of behavioral function and intervention by training provider

	No training	SESS	Other training	Total
Incorrect Responses	37 40.7%	7 20.6%	4 18.2%	48 32.7%
Correct Responses	54 59.3%	27 79.4%	18 81.8%	99 67.3%
Total	91 100%	34 100%	22 100%	147 100%

The relationship between correct responses SESS and other training providers was not significant. Since 25% of cells had an expected frequency of less than 5, the appropriate statistical test was Fisher's Exact Probability ($p = 1.00$ for a two-sided test).

The other training provider group had the highest correct response rate with 81.8%. The SESS training group had 79.4% followed by the group with no CB training with a 59.3% correct response rate.

7.8.9. Suppressed Behaviour

In order to assess participants' knowledge of the need for functional equivalent replacement behaviours the following open-ended question was posed: *A challenging behaviour that is suppressed with a disregard for its function may result in...*

While it is often possible to change behaviour without understanding and accounting for its function, this is not considered best practice (Emerson, 2001). In this question 'suppressed' refers to the forcible termination of a challenging behaviour through means that do not account for the function of that behaviour for the individual (e.g. restraint chairs to prevent out of seat behaviour, topical application of aversive liquids to hands and objects to prevent mouthing). The use of information derived from the functional assessment of challenging behaviour tends to result in long-term behaviour change and ethical interventions (Alberto & Troutman, 2009). Suppressing behaviour without replacing it with a functional equivalent is likely to result in symptom substitution, i.e., the appearance of a new inappropriate behaviour or increased intensity of the original behaviour after a brief hiatus. Responses that reflected this were recoded as 'correct' while other responses not fulfilling these criteria were coded as 'incorrect'.

Table 23 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in ASD from other sources.

Table 23: Knowledge of the suppression of behaviour by training provider

	No training	SESS	Other training	Total
Incorrect Responses	70 76.9%	17 50.0%	6 27.3%	93 63.3%
Correct Responses	21 23.1%	17 50.0%	16 72.7%	54 36.7%
Total	91 100%	34 100%	22 100%	147 100%

The relationship between correct responses SESS and other training provider was not significant. The Chi-Square value 2.851 had an associated probability value of ($p=0.091$, $Df=1$), showing that an association was unlikely to have arisen as a result of sampling error.

The rate of correct response for the other training provider group was highest for this survey item at almost 73% with the SESS training group split with 50% correct response rate. The group with no training in CB had the lowest rate of correct responses with 23%.

7.8.10. Positive Approach to Challenging Behaviour

In order to assess participants' knowledge of positive behavioral interventions the following multiple-choice question was posed: *A positive approach for interventions for challenging behaviours would NOT include: use of aversives, consistent response to behaviour, or building appropriate skills.*

The correct answer is ‘use of aversives’. Positive approaches to behaviour intervention do not include aversives but do require consistency of approach and often teach new appropriate alternative behaviours (Donnellan et al. 1988). Responses indicating ‘use of aversives’ were recoded as ‘correct’; all others were marked as ‘incorrect’.

Table 24 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in ASD from other sources.

Table 24: Knowledge of positive approaches to challenging behaviour by training provider

	No training	SESS	Other training	Total
Incorrect	48	11	8	67
Responses	52.7%	32.4%	36.4%	45.6%
Correct	43	23	14	80
Responses	47.3%	67.6%	63.6%	54.4%
Total	91	34	22	147
	100%	100%	100%	100%

The relationship between correct responses SESS and other training provider was not significant. The Chi-Square value 0.096 had an associated probability value of ($p=0.757$, $Df=1$), showing that an association was unlikely to have arisen as a result of sampling error.

The SESS training group had a slightly higher correct response rate at 68% to the other training provider group’s rate of 64%. The no training in challenging behaviour group had just fewer than 50% correct responses to this survey item.

7.8.11. Section summary

In sum, with regard to knowledge of challenging behaviours, respondents were classified as either trained by the SESS (n=34) or other training providers (n=22). Respondents who reported no prior training in the area of CB by leaving provider information blank or recording 'none' (n=91) were labeled the no training group. These results are reported for the purpose of comparison.

The challenging behaviour content section consisted of 10 questions. The SESS group (n= 34) had a mean score of 4.65 with a standard deviation of 2.04. The other provider group (n=22) had a mean score of 5.09 with a standard deviation of 2.34. The no training group had a mean score of 3.46 correct with a standard deviation of 2.61. The Cronbach's Alpha for the series of survey items analyzed for knowledge of challenging behaviour was 3.61. This alpha score indicates that these items are not reliable as use as a measurement scale of knowledge of challenging behaviour and therefore, comparison of the means scores of the various groups is not recommended. As such, t-tests and ANOVAs are not necessary under the circumstances.

7.9. Knowledge Regarding Applied Behaviour Analysis

Participant knowledge of applied behaviour analysis was evaluated as the third and final content knowledge probe. Participants were grouped based on data provided regarding professional development in the area of applied behavior analysis (i.e. national professional development provider group and other provider group). The numbers of participants in any CPD with a focus on applied behaviour analysis or functional behavioural assessment (FBA) are considerably reduced. Fully two-thirds of the respondents in the current research reported having had no professional

development in ABA. Of those the teachers who have attended ABA training 75% named the SESS as the CPD provider. The data regarding FBA training shows half of the reports (n=30) of CPD in this area were provided by the SESS. The limited data in this category, while expected considering the limited literature on FBA use in Irish educational settings, raises questions about the training provided in applied behavior analysis. FBA methodology is generally considered a key topic for instruction in the science of behaviour analysis (Alberto & Troutman, 2009; Cooper et al., 2007) and a useful technology for use with challenging behaviour in school settings (Moreno, 2010; Scott & Kamps, 2007).

7.9.1. Dimensions of Behaviour

In order to assess participants' knowledge of the measurable dimensions of behaviour the following true/ false question was posed: *Behaviour, defined as the interaction of an organism with its environment, can be measured in various ways, including: frequency, duration, latency, and force.*

This statement is 'true'. Behaviour is an observable (i.e. publicly or privately) phenomenon that can be measured along various dimensions. These measurements are important data points in assessing behaviour and behaviour change programmes (Grant & Evans, 1994).

Table 25 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in ABA from other sources.

Table 25: Knowledge of behavioural dimensions by training provider

	No training	SESS	Other training	Total
Incorrect	38	8	3	49
Responses	34.5%	21.1%	30.0%	31.0%
Correct	72	30	7	109
Responses	65.5%	78.9%	70.0%	69.0%
Total	110	38	10	158
	100%	100%	100%	100%

The relationship between correct responses for SESS and other training providers was not significant. Since 25% of cells had an expected frequency of less than 5, the appropriate statistical test was Fisher's Exact Probability ($p = .675$ for a two-sided test).

SESS training group had a 79% correct response rate compared to 70% for those with training from other providers. The participants with no training in ABA had a 65.5% correct response rate for this survey item.

7.9.2. ABA and Socially Significant Behaviours

In order to assess participants' knowledge of the social validity within applied behaviour analysis the following multiple-choice question was posed: *The goal of an applied behaviour analysis (ABA) intervention is: to eliminate targeted behaviours, to improve socially significant behaviours, to reduce stress for carers/ teachers.*

Correct response for this item is: to improve socially significant behaviours. A major requirement of the science of behaviour analysis is that social validity of an intervention and its components be established through approval of target behaviours, methods of behaviour change, and intervention outcomes by stakeholders including the client where possible (Emerson, 2001).

Table 26 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in ABA from other sources.

Table 26: Knowledge of ABA and socially significant behaviors by training provider

	No training	SESS	Other training	Total
Incorrect responses	84 76.4%	24 63.2%	7 70.0%	115 72.8%
Correct Responses	26 23.6%	14 36.8%	3 30.0%	43 27.2%
Total	110 100%	38 100%	10 100%	158 100%

The relationship between correct responses for SESS and other training providers was not significant. Since 25% of cells had an expected frequency of less than 5, the appropriate statistical test was Fisher's Exact Probability ($p= 1.00$ for a two-sided test).

Teachers were asked about the general goal of a behavioural intervention using ABA-based methodology. The SESS correct response rate of 37% was highest for this survey item yet over 63% of those with SESS training answered incorrectly this

survey item. Similarly, 70% of those with other CPD in the area of behaviour analysis replied incorrectly to the question, followed by the no ABA training group with a 76% incorrect response rate.

7.9.3. Positive reinforcement of behaviour

The present survey item was present as to require to answers to the one question. Each answer will be treated separately in **Table 25** and **Table 26** since each answer was independent of the other.

In order to assess participants' knowledge of both positive and negative reinforcement as integral elements of behavioral analysis following question was presented: *Which stimuli increase the likelihood of a behaviour occurring in the future? Choose as many as apply. Positive reinforcement, positive punishment, negative reinforcement, negative punishment.* The correct choices are *positive reinforcement* and *negative reinforcement*.

Table 27 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in ABA from other sources with regard to *positive reinforcement*.

Table 27: Knowledge of increasing behaviour with positive reinforcement by training provider

	No training	SESS	Other training	Total
Incorrect	54	14	4	72
Responses	49.1%	36.8%	40.0%	45.6%
Correct	56	24	6	86
Responses	50.9%	63.2%	60.0%	54.4%
Total	110	38	10	158
	100%	100%	100%	100%

The relationship between correct responses for SESS and other training providers was not significant. Since 25% of cells had an expected frequency of less than 5, the appropriate statistical test was Fisher's Exact Probability ($p = 1.00$ for a two-sided test).

SESS training group had a correct response rate of 63.2%. The other training provider group had a correct response rate of 60% while the group with no training in ABA responded correctly at a rate of 51% for this answer for this survey item.

Table 28 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in ABA from other sources with regard to *negative reinforcement*.

Table 28: Knowledge of increasing behaviour with negative reinforcement by training provider

	No training	SESS	Other training	Total
Incorrect Responses	94 85.5%	34 89.5%	9 90.0%	77 48.7%
Correct responses	16 14.5%	4 10.5%	1 10.0%	81 51.3%
Total	110 100%	38 100%	10 100%	158 100%

The relationship between correct responses for SESS and other training providers was not significant. Since 25% of cells had an expected frequency of less than 5, the appropriate statistical test was Fisher's Exact Probability ($p= 1.00$ for a two-sided test).

Although all correct response rates were very low, the no ABA training group recorded the highest rate with 14.5% correct. The SESS training group had a rate of correct response of 10.5% while the other training provider group had a rate of 10%.

7.9.4. Time Out from Positive Reinforcement

In order to assess participants' knowledge of a time out procedure the following open-ended question was posed: *As a form of negative punishment, what is removed to affect a 'timeout' procedure for a student's behaviour?*

In behavior analysis, the term of this procedure is ‘time out from positive reinforcement’ (Cooper et al, 2007). As such, all responses indicating the removal of reinforcing consequences were coded as ‘correct’.

Table 29 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in ABA from other sources.

Table 29: Knowledge of time out procedure by training provider

	No training	SESS	Other training	Total
Incorrect	104	33	9	146
Responses	94.5%	86.8%	90.0%	92.4%
Correct	6	5	1	12
Responses	5.5%	13.2%	10.0%	7.6%
Total	110	38	10	158
	100%	100%	100%	100%

The relationship between correct responses for SESS and other training providers was not significant. Since 25% of cells had an expected frequency of less than 5, the appropriate statistical test was Fisher’s Exact Probability ($p= 1.00$ for a two-tailed test).

To test teacher knowledge of this concept, this survey asked respondent to describe what is removed in order to make this form of negative reinforcement effective. Only 13% of the teachers reporting SESS training in the principles of ABA correctly indicated the required removal of the reinforcing consequence to make time out

effective. Other respondents replied with similar results (i.e. 10% correct responses) and no training group rate of correct responses was 5.5%.

7.9.5. Shaping of Target Behaviour

In order to assess participants' knowledge of shaping target behaviour the following multiple-choice question was posed: *When approximations of target behaviour are reinforced, we are using which methodology: shaping, extinction, or variable reinforcement.*

The correct response was 'shaping'. Shaping teaches new behaviour by reinforcing successive approximations of the target behaviour (Alberto & Troutman, 2009).

Table 30 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in ABA from other sources.

Table 30: Knowledge of shaping of target behaviour by training provider

	No training	SESS	Other training	Total
Incorrect	72	12	6	90
Responses	65.5%	31.6%	60.0%	57.0%
Correct	38	26	4	68
Responses	34.5%	68.4%	40.0%	43.0%
Total	110	38	10	158
	100%	100%	100%	100%

The relationship between correct responses for SESS and other training providers was not significant. Since 25% of cells had an expected frequency of less than 5, the

appropriate statistical test was Fisher's Exact Probability ($p = .145$ for a two-sided test).

SESS training group rate of correct responses was 68.4% for this survey item. The rate of correct response for the other training provider group was 40% while the group with no ABA training had a rate of 34.5%.

7.9.6. Stimulus Fading

In order to assess participants' knowledge of the use of stimulus fading the following true/ false question was posed: *Stimulus fading is when antecedent stimulus is changed while maintaining the target response.*

This statement is 'true'. According to Cooper and colleagues (2007) stimulus fading is similar to shaping procedures in that both change behavior gradually. Stimulus fading builds new behaviour by providing an effective stimulus at the initial stages and then gradually fading the stimulus to induce the same target behaviour.

Table 31: compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in ABA from other sources.

Table 31: Knowledge of stimulus fading by training provider

	No training	SESS	Other training	Total
Incorrect	58	13	5	76
Responses	52.7%	34.2%	50.0%	48.1%
Correct	52	25	5	82
Responses	47.3%	65.8%	50.0%	51.9%
Total	110	38	10	158
	100%	100%	100%	100%

The relationship between correct responses for SESS and other training providers was not significant. Since 25% of cells had an expected frequency of less than 5, the appropriate statistical test was Fisher's Exact Probability ($p = .468$ for a two-sided test).

The highest rate of correct responses, 65.8% was recorded by the SESS training group. The other training provider group had a correct response rate of 50%, similar to the group with no ABA training that had a 47.3% rate for this survey item.

7.9.7. Generalization of Behaviour

In order to assess participants' knowledge of the generalization of new behaviour the following open-ended question was posed: *A behaviour that occurs across different settings, with different people, and over an extended time is said to have been...*

The correct answer was 'generalized'. Once instruction has been terminated, the target behaviour needs to occur under a variety of conditions in order for response competence to be inferred. Generalization assures that acquired behaviour has

become functional for the learner (Alberto & Troutman, 2009). ‘Generalized’ was the only term coded as ‘correct’.

Table 32 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in ABA from other sources.

Table 32: Knowledge of generalization of behaviour by training provider

	No training	SESS	Other training	Total
Incorrect Responses	107 97.3%	31 81.6%	8 80.0%	146 92.4%
Correct responses	3 2.7%	7 18.4%	2 20.0%	12 7.6%
Total	110 100%	38 100%	10 100%	158 100%

The relationship between correct responses and training providers was not significant. Since 25% of cells had an expected frequency of less than 5, the appropriate statistical test was Fisher’s Exact Probability ($p = 1.00$ for a two-tailed test).

The participants in this survey were asked about behaviour generalization. Given a definition fewer than 1 in 5 teachers with SESS training in ABA were able to identify the definition as fitting the term generalization. Similar results were recorded by those having other CPD provision. The other training provider group had the highest rate of correct responses for this survey item with 20%. The SESS

group with 18.4% correct responses was the next highest rate. The no ABA training group had a correct response rate of only 2.7% for this item.

7.9.8. Functional Behavioural Assessment

In order to assess participants' knowledge of the elements of a functional behavioural assessment the following multiple-choice question was posed: *Which of these is NOT determined as part of a functional behavioural assessment to develop an effective behaviour change programme: antecedent variables, physical prompts, or consequent variables.*

The correct answer was 'physical prompts'. As exemplified by the A-B-C assessment chart method for gathering descriptive data, antecedent and consequent variables are key elements to the functional assessment process (Alberto & Troutman, 2009) while physical prompts are strategies appropriate for certain behaviour change programmes implemented as a result of the functional behavioural assessment (Grant & Evans, 1994).

Table 33 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in ABA from other sources.

Table 33: Knowledge of functional behavioural assessment by training provider

	No training	SESS	Other training	Total
Incorrect Responses	87 79.1%	19 50.0%	7 70.0%	113 71.5%
Correct Responses	23 20.9%	19 50.0%	3 30.0%	49 28.5%
Total	110 100%	38 100%	10 100%	158 100%

The relationship between correct responses the SESS and other training providers were not significant. Since 25% of cells had an expected frequency of less than 5, the appropriate statistical test was Fisher's Exact Probability ($p = .307$ for a two-sided test).

The SESS training group had the highest correct response rate with 50% for this survey item. Other training provider group with 30% was second highest correct response rate with 20.9% recorded by the group with no training in ABA.

7.9.9. Negative Reinforcement Contingencies

In order to assess participants' knowledge of the effect of negative reinforcement the following multiple-choice question was posed: *Which of these statements is TRUE?*

- *Punishment is ineffective at reducing target behaviour.*
- *Applied behaviour analysis is a behaviour change programme created especially for use with people with autism spectrum disorders.*

- *Negative reinforcement contingencies serve to increase target behaviour.*
- *Reinforcement must follow every occurrence of target behaviour to have a reinforcing effect.*

The correct answer was: Negative reinforcement contingencies serve to increase target behaviour. By definition, reinforcement must result in an increase in behaviour, while ‘negative’ reinforcement indicates the removal of a stimulus to achieve this effect (Cooper et al. 2007).

Table 34 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in ABA from other sources.

Table 34: Knowledge of negative reinforcement contingencies by training provider

	No training	SESS	Other training	Total
Incorrect Responses	104 94.5%	32 84.2%	9 90.0%	145 91.8%
Correct response	6 5.5%	6 15.8%	1 10.0%	13 8.2%
Total	110 100%	38 100%	10 100%	158 100%

The relationship between correct responses the SESS and other training providers were not significant. Since 25% of cells had an expected frequency of less than 5, the appropriate statistical test was Fisher’s Exact Probability ($p= 1.00$ for a two-sided test).

The correct response rate of the SESS, 15.8% was highest for this survey item with the other training provider group registering a 10% rate of correct responses. The no training group had a correct response rate of 5.5% for this item.

The current research indicates that few teachers of students with ASD are knowledgeable of negative reinforcement as a means of increasing behaviour. Slightly more than 15% of the respondents in receipt of SESS training in ABA methods correctly identified this as the effect of negative reinforcement. Additionally, the same survey item indicates that a large portion of the respondents (40%) regardless of CPD experience believe a reinforcer must be delivered at every occurrence of a behaviour in order for effective reinforcement. This misunderstanding may influence teachers' perception of ABA methods as being difficult to implement and labour intensive and may account for the low levels of participation in ABA-based professional development found in this research.

7.9.10. ABC Data Collection Charts

In order to assess participant knowledge of antecedent-behaviour-consequence (ABC) data collection charts the following true/false question was presented: *True or false: An ABC (antecedent-behaviour-consequence) chart is an example of a task analysis.*

The correct answer is *False*. An ABC chart is used to collect behavioural data as part of a functional behavioural assessment or an ongoing behaviour intervention programme (O'Neill et al., 1997). This methodology has been frequently employed in schools settings by teachers (Moreno, 2010).

Table 35 compares the accuracy of responses of those indicating no training, training provided by the SESS, and those receiving training in ABA from other sources.

Table 35: Knowledge of ABC data collection charts by training provider

	No training	SESS	Other training	Total
Incorrect	89	22	8	119
Responses	80.9%	57.9%	80.0%	75.3%
Correct	21	16	2	39
Responses	19.1%	42.1%	20.0%	24.7%
Total	110	38	10	158
	100%	100%	100%	100%

The relationship between correct responses the SESS and other training providers were not significant. Since 25% of cells had an expected frequency of less than 5, the appropriate statistical test was Fisher's Exact Probability ($p = 2.82$ for a two-sided test).

The SESS training group had the highest rate of correct responses to this survey item with 42.1%. The other training provider group had a 20% correct response rate with the no ABA training group following with 19.1% correct responses to this item.

7.9.11. Section Summary

In sum, for the section regarding knowledge of ABA participants were classified as either SESS ($n = 38$) or other training provider ($n = 10$). Respondents who reported no prior training in the area of ABA by leaving provider information blank or recording 'none' ($n = 110$) were classified as the no training group. These results are reported for the purpose of comparison.

While more than a third of respondents with SESS training in the area of ABA methods reported good knowledge of this material, this group answered correctly on fewer than half of the survey items for ABA knowledge. The other training group and no training group recorded fewer correct responses. The discrepancy between self-reported knowledge and test item performance was notable.

In the final section of this survey fewer respondents participated in the test of knowledge regarding ABA than the previous content areas. Although data was not collected on disengagement with the survey, it may be that a number of teachers did not have the confidence in the subject matter to answer these questions. It was clear in the self-report of knowledge that only a small cohort of the participants had knowledge of this complex field. Additionally, as the final stage of the survey process, respondents may have discontinued due to ennui.

The ABA knowledge section had a total of ten survey items. Based on the responses provided when asked to indicate professional development provider for applied behaviour analysis, the SESS group ($n=38$) had a mean score of 4.63 correct responses with a standard deviation of 2.88. The other provider group ($n=10$) had a mean score of 3.50 correct responses with a standard deviation of 2.79. The no training group ($n=110$) had a mean score of 2.9 correct responses with a standard deviation 2.29. The Cronbach's Alpha for these survey items was .274. As a result the scores for this series of items for knowledge of applied behaviour analysis should not be considered a scale measure and comparisons are not recommended. Furthermore, t-tests and ANOVAs are not required for this data as a result of the reported alpha.

8. Discussion, Recommendations, Limitations, and Conclusion

8.1. Introduction

Educational focus has shifted to increased accountability for improved learner outcomes and teacher efficacy as a means of accomplishing this end. Efforts to standardize expectations have particularly gained prominence in the US with similar trends appearing in Europe as well.

In order to improve educational standards for all students educational authorities have increased efforts to recruit, train, and retain highly qualified educators as a means of affecting greater student achievement. The training of teachers, both at the initial and in-career stages, has long been the unchallenged remit of institutes of higher education and CPD providers. The recent economic downturn has hastened the need for fiscal responsibility through cost-benefit analyze by government educational authorities worldwide. In light of this trend, Irish teacher education needs to adapt and acquire data collection procedures to allow for analysis of educational expenditure in the future.

8.2. Discussion of findings

8.2.1. CPD providers in the Irish context

For Irish teachers, official professional development opportunities are provided by and/or approved by the Teacher Education Section of the Department of Education and Skills (The Teaching Council of Ireland, 2011b). The agency engaged by the Department for CPD in the area of special educational needs is the Special Education Support Service (Price, Waterhouse, and Coopers LLB, 2012). Established in 2003, the Special Education Support Service (SESS) is a teaching and learning support agency utilizing seconded teachers as peer experts in the role of CPD presenters (Egan, 2004; Price, Waterhouse, and Coopers LLB, 2012).

As the official professional support provider (e.g. CPD, school visits, resource library) funded by the Department of Education and Skills, SESS training events provide official release from school duties, substitute coverage, and mileage reimbursement for travel to venues in addition to being free of charge to teacher attendees (Special Education Support Service, 2013). These benefits may serve to increase teacher participation in SESS professional development in light of the absence of official requirements to participate in CPD for midcareer teachers (The Teaching Council of Ireland, 2011b).

The professional development provider results of the current research indicate the key role in teacher education played by the Special Education Support Service. With the teaching population in Ireland largely trained in ITE programmes with little SEN emphasis (Banks & Smyth, 2011; O'Gorman & Drudy, 2010) this state funded provider is responsible for CPD opportunities for SEN teachers and mainstream teachers alike (Special Education Support Service, 2013). Despite this pivotal role and substantial funding allocation (Price, Waterhouse, and Coopers LLB, 2012) little research or data collection regarding efficacy of training provision exists to date (Banks & Smyth, 2011; Price, Waterhouse, and Coopers LLB, 2012).

Effective classroom teaching and optimal learner outcomes rely heavily on teacher expertise in the content area and pedagogy (Darling-Hammond, 2005). These principles of effective educators apply equally to SEN education in Ireland (Clarke, Lodge, & Shevlin, 2012; Kearns & Shevlin, 2006). The research conducted on educational initiatives in Ireland has lacked data collection and relies heavily on participant satisfaction surveys (Egan, 2004) and a recent review has recommended the collection of outcome data as well as the collection of a participant database for SESS training activities (Price, Waterhouse, and Coopers LLB, 2012). Although the current research fails to advance the database of CPD participation and efficaciousness, it may serve as a cursory example of the type of learner outcome information necessary from future professional development activities undertaken by Irish teachers.

8.2.2. ASD knowledge of Irish teachers

8.2.2.1. Triad of impairments of ASD

Over several decades, ASD has been understood as a triad of impairments (Wing & Gould, 1979) consisting of deficits in social interaction, communication, and imagination. While the impairment of imagination has been described in terms of repetitive, inflexible behaviours and thoughts (Szatmari et al., 2006), the triad representation of ASD has been consistently applied throughout the literature (Fombonne, 2005; The Task Force on Autism, 2001) including in SESS professional development activities (Special Education Support Service, 2014a). Along with the spectrum nature of the disability, the triad of impairments of ASD has long been an identifying characteristic often used as introductory material in media, journal articles, and training materials.

Despite the near universal use of the triad of impairments to describe the diagnostic implications of ASD a very high proportion of Irish teachers in the current research could not correctly name the third domain when given two. Recent revision of the Diagnostic and Statistics Manual (American Psychiatric Association, 2013) has altered the triad representation of the diagnostic criterion for autism by combining socialization (i.e. social interaction) with communication into one domain (i.e. social communication) while the second domain was maintained as repetitive behaviours. Although this change may have caused confusion among professionals and members of the public, it would not have been a factor in this research as the data collection predates the publication of the revised DSM 5.

8.2.2.2. Positive outcomes of interventions for ASD

Almost two thirds of all respondents incorrectly believed that developmental delays present in early childhood for those diagnosed with ASD were permanent and fixed for life. Teachers having participated in the SESS autism specific professional

development fared only slightly better with 64% responding incorrectly. Although there exists a well-documented history of positive outcomes for individuals with ASD through behavioral interventions (e.g. Carr & Durand, 1985; Lovaas, 1987), Irish teachers of students with ASD appear to be widely unaware of the benefits of such interventions. More recent research report optimal outcomes for some people with ASD (Eikeseth, Smith, Jahr, & Eldevik, 2002; Fein et al., 2013) and the literature on early intensive behavioural interventions for ASD confirms this evidence (Remington et al., 2007). The survey participants, who are all currently teaching students with an ASD diagnosis, appear to be unaware of research on effective educational outcomes for this population. The evidence-base for ASD educational interventions has largely been ignored by teachers.

8.2.2.3. Prevalence rates of ASD

Current prevalence rates of ASD have been noteworthy both in the professional literature (CDC, 2009; Fombonne, 2001) and mass media (Leader, 2012) as concern mounts regarding the trend for more and more people being diagnosed with autism. Despite the statistical increase in the overall prevalence of ASD, the ratio of males to females affected (approximately 4:1) has remained relatively static over several decades (CDC, 2009; Fombonne, 2003; Lord, Schopler, & Revicki, 1982). This basic information regarding the distribution of the population with ASD was not known by an overwhelming majority of those having taken CPD with the SESS while respondents with training providers other than the SESS reported a slightly lower error rate.

Prevalence rates for autism has dominated the discussion of this disability for the past decades with several theories regarding the perceived increase in ASD becoming serious issues of contention in mainstream media, research journals, and internet blogs and news servers. The consistency of the male to female ratio of the population diagnosed with ASD has been a significant piece to the research into prevalence as well as aetiology of autism. The responsible for teaching children with ASD and providing support to families of these students need to be aware of such developments and keep current with updates to the research evidence.

8.2.2.4. Implications

In the field of ASD education, there are several key concepts that should be understood by practitioners. Although knowledge in this area is increasing regularly through medical research into causes, sociological studies regarding prevalence, and educational research into efficacious interventions capable of producing improved outcomes across the lifespan, teachers of students with ASD should acquire such knowledge and keep up to date on current developments in the field. Knowledge of the triad of impairments will continue to be important as the new triad view (American Psychiatric Association, 2013) of the disability takes hold in the public forum, prevalence rates and related issues (e.g. ratio of males to females diagnosed, causes of rising rates of autism) are especially concerning to parents, and research supporting efficacious interventions for use by educators of students with ASD are critical content issues for those responsible for educating students with ASD.

In comparison to the current results, a Canadian study (Leblanc, Richardson, & Burns, 2009) reported significant gains in ASD knowledge among participants in brief CPD on autism and effective interventions. Similar results to the current research were reported by Hamad, Serna, Morrison, and Fleming (2012). This research of American initial teacher education for early childhood professionals found substantial gaps in ASD knowledge despite self-reported knowledge being moderately high. The results in the current research, low levels of teacher knowledge despite content specific training, are similar to that found in previous studies. However, CPD in the area has proven effective in other research. It may be concluded that the CPD provided to Irish teachers has been deficient in its content or methodology to result in adequate learner outcomes for participants.

8.2.3. Knowledge of challenging behaviour by Irish teachers

8.2.3.1. Definition of challenging behaviour

Defining terms relating to areas of academic interests is generally a preliminary procedure in teacher training and CPD. When issues arise regarding student behaviour that may be labeled as challenging, it is imperative to provide specific definitions of the key terms.

Since determining behaviour to be problematic is a subjective process based on individualized beliefs and values (Clements, 2005), making this determination should be based on a functional definition of challenging behaviour (Emerson, 1995). A frequently cited definition of challenging behaviour, Emerson (1995) asserts that the behaviour must be likely to cause physical harm to self or others or be likely to result in significant social exclusion. This definition is both inclusive (i.e. it is not specific to a particular diagnosis), systemic (i.e. it seek to mollify behaviour for acceptability for an environment), and student centered.

A large percentage of the participants in the current research incorrectly defined challenging behaviour. In fact 42% of all respondents defined challenging behaviour in relation to teacher effectiveness. Although the presence of serious and persistent challenging behaviour can have a detrimental effect on learner outcomes (National Behaviour Support Service, 2013; Task Force on Student Behaviour, 2006) more effective behavioural interventions are based on improving student outcomes (Bailey, Ridley, & Greenhill, 2010; Doody, 2009).

A view of student behaviour as inappropriate only if it disturbs the teacher's effectiveness or constitutes rule breaking behaviour ignores the movement away from within child definition of challenging behaviour towards a systemic view (Cole, 2003; Cooper & Jacobs, 2011). With this perspective it becomes possible to implement behaviour change systems that encourage improved behaviours by making environmental modification, teaching new skills and rewarding appropriate behaviours (Lewis & Newcomer, 2005; Sugai & Simonsen, 2012). The high number of incorrect responses in the current research for this item may be the result of the limited exposure Irish teachers have to positive behaviour supports (O'Leary, 2011; Doody, 2009) or ABA, both of which have a child-centered perspective at the core of

the methodology. However, this definition was presented by the largest teachers' union more than a decade earlier in its guiding document on the subject of challenging behaviour (Irish National Teachers Organization, 2004). Despite this frequent reference to a systemic view of challenging behaviour teachers of students with ASD in Ireland have not internalized the definition presented in this research.

8.2.3.2. Passive behaviours

In the current research, few teachers were able to identify a passive behaviour that may be considered as challenging under certain circumstances. Also referred to as internalized behaviour, withdrawn or passive behaviour can be as problematic in educational settings as overt, aggressive behaviour. Of the resort of female students with emotional difficulties (Macleod, 2006), student disengagement with education has been noted in the literature and made a focal point of training for teachers and other professionals. The danger of overlooking the emotional needs of withdrawn students has been clearly emphasized as being on par with those of students who act outwardly (Lowe 2007). These passive behaviours were identified by teachers and principals in Irish schools as creating stressful learning environments (Kelly et al., 2007) and yet few teachers in the current study were able to identify a passive behaviour as challenging.

8.2.3.3. Entrenched behaviours

Entrenched behaviours (i.e. behaviours with a long history of reinforcement; Cooper et al., 2007) may require longer periods of intervention to affect change. Less than a third of teachers with SESS training in challenging behaviour correctly identified this phenomenon yet a significantly smaller proportion of the respondents with CPD from other sources failed to observe the importance of the history of reinforcement to behaviour change programmes. Entrenched behaviours, due to the longevity of their occurrence and their resistance to intervention attempts, are very commonly the issue of concern for teachers (Westling, 2010).

Traditional SEN training programmes in Ireland, both in ITE and CPD, have placed little emphasis on applied behaviour analysis and its methodologies (Keenan,

Dillenburger, Moderato, & Hanns-Rudiger, 2010; Leslie & Tierney, 2013). Several of the procedures developed within this science are particularly relevant to the implementing behaviour change plans with entrenched behaviours (e.g. reinforcement of alternative behaviours, functional behaviour assessment; Alberto & Troutman, 2009). Participation in ABA-based CPD by some of the respondents in the non-SESS group may account for the significant increase in correct answers to this survey item. Although this survey included several respondents with previous teaching and training in applied behaviour analysis, the source of training was recorded as 'other' when phrases like 'in-house' or 'school-based' were used to describe the training provider by respondents.

Criticisms of failed attempts to change behaviour through the use of behavioural principles (Woods, 2010) may well be attributed to the lack of persistence of teachers to continue applying the intervention past the point of resistance created by the prolonged history of reinforcement (i.e. entrenchment). Behavioural interventions implemented by those with expertise in the science of behaviour will be cognizant of this concept as well as the extinction burst often presented prior to the elimination of behaviour (Cooper et al., 2007).

8.2.3.4. Suppressed behaviours

Challenging behaviours are often suppressed or attempts are made to eliminate the behaviour without consideration for the purpose behind it. Behavioural function is the key element behind an ABA-based behaviour change intervention (Alberto & Troutman, 2009). Use of behavioural techniques, as well as any other intervention methods, without consideration of the function filled by the target behaviour will most likely have retrograde effect.

Several variations of this concept have been presented in the literature but particularly of interest is the view that all behaviour, including challenging behaviour, is an attempt to communicate (e.g. a need, desire, or want; O'Leary 2011). This theory is roughly equivalent to the behavioural function premise that is at the heart of ABA methods with added relevance that it is prominent in the SESS CPD on challenging behaviour (O'Leary, 2011) and that of the NCSE (Cooper &

Jacobs, 2011). CPD on challenging behaviour for Irish teachers would likely include information on the function or communicative intent of behaviour and should consider the affects of ignoring this in a behaviour change programme.

The current research reports only half of the teachers having SESS training in the area of challenging behaviour correctly responded that a suppressed behaviour will result in a new CB or an intense outburst of the target behaviour. Nearly 2/3 of the respondents with another source of CPD in this area were correct on this survey item. The discrepancy in correct responses may be a result of the SESS training removing the formal language of ABA (e.g. behavioral function) for a layman interpretation of this concept (e.g. communicative intent). Teachers having receive CPD with this informal language were not able to equate it with the professional jargon of behavioural science.

8.2.3.5. Implications

With challenging behaviour in schools perennially a topic of concern for teachers, principals, and the public (Kelly et al., 2007; Westling, 2010) there appears to be a lack of formalized CPD in this area by Irish educational support services. The efficacy of ABA and behavioural-based programmes (i.e. positive behaviour supports) has been evident for many years. Several decades have past since support for ABA came from a highly regarded government bodies in the US (US Surgeon General, 1999).

Yet in Ireland, programmes in the area of challenging behaviour have not adopted the empirically supported methods beyond pilot project status (National Behaviour Support Service, 2013) nor has CPD included these methods even though they have been identified by the SESS and NCSE (O'Leary, 2011; Cooper & Jacobs, 2011). When behaviour concerns of teachers and schools go beyond standard classroom management issues, full implementation of evidence-based behavioural methods is required.

8.2.4. Knowledge of ABA methods by Irish teachers of students with ASD

8.2.4.1. ABA intervention goal

Few survey participants could identify the true goal of behavioural interventions as stated in ABA texts (e.g. Cooper et al., 2007; Alberto & Troutman, 2009) and journal articles (e.g. Baer et al., 1968; Dixon et al., 2012). The science of behaviour has as its stated purpose to improve ‘socially significant’ behaviours of the subjects (Baer et al., 1968) rather than the more negatively expressed option of eliminating target behaviours or teacher-centered stress reduction alternative yet 2/3 of those trained in ABA by the SESS were incorrect on this item.

The SESS CPD in ABA uses the text authored by Alberto and Troutman (2009) that most definitely addresses the issue of the goal of ABA interventions in these precise terms. The view of ABA as a method for eliminating problem behaviours seems to persevere. This may be due to the official policy in Ireland to deny ABA-based education for students with ASD (O’Sullivan, 2010) and support for eclectic approaches (Task Force on Autism, 2001; Parsons, 2009). Irish teachers of students with ASD have not been exposed to the skills building perspective of behavioural methods in education through this shortsighted government position on ABA educations programmes.

8.2.4.2. Use of time out by Irish teachers of students with ASD

Time out procedures have been a popular mechanism within school discipline procedures for quite some time (Maag, 2001; Yang, 2009). While this procedure can be effective under the certain circumstances (e.g. used with a behaviour that is reinforced by social attention; Cooper et al., 2007), it should be expected that any teacher using the method would understand when and how to implement time out properly. Time out procedures are regularly discussed as appropriate methods of classroom behaviour management (Irish National Teachers Organization, 2004; Rogers, 2007) yet many studies show the ineffectiveness of the method when applied inappropriately (Cipani, 2004).

The current research found very few teachers, regardless of CPD training status, could properly identify the maintaining variable required to make a time out

procedure effective. 'Time out from social reinforcement' is the complete name of the procedure commonly referred to as 'time out' in schools and homes. A behaviour not maintained by social reinforcement (e.g. social attention, peer praise) will not be diminished by a time out procedure. Teachers simply remove a student from the classroom or activity area for misbehavior without regard for the function of the behaviour. When the behaviour is being maintained by escape/ avoidance of unwanted stimuli, the target behaviour is likely to increase through the use of time out. This is referred to as a negative reinforcement trap: the student is reinforced for his behaviour by escaping the stimuli and the teacher is reinforced for his behaviour of removing the student by lessened disruption in class.

Through behavioural training would emphasize behavioural function as the starting point of any behaviour change procedure (Alberto & Troutman, 2009). Use of tie out, extinction, response cost, and more are only recommended after the function of behaviour has been determined (Moreno, 2010).

8.2.4.3. Generalization of behaviors in ASD

The literature on educating students with ASD regularly advises teachers to be vigilante against students learning skills in narrow context and failing to generalize these into the wider environment (Clements & Zarkowska, 2000; Howlin, 1998). Teachers of students with ASD need to utilize methods to encourage generalization of skills across settings, with different people, and over an extended period of time (Alberto & Troutman, 2009; Cowan & Allen, 2007; Grant & Evans, 1994).

Despite the concept of behaviour/ skill generalization being crucial in the education of students with ASD, fewer than one in five Irish teachers with SESS and other CPD in applied behaviour analysis recognized the definition of this term.

8.2.4.4. Implications

ABA training through SESS CPD for Irish teachers consists of a 20-hour seminar spread over 4 or 5 days usually spread over several weeks (Special Education Support Service, 2014b). While numbers of participants in the study who have been in receipt of this training are low (n=38), the responses to the individual items of ABA knowledge do not indicate a broad depth of understanding of key concepts of the science of behaviour.

Brief training in the science of behaviour analysis does not produce adequate understanding of all the methodologies of ABA (Grey, Honan, McClean, & Daly, 2005). Yet further research has shown more promise with regard to training parents and carers in ABA methods (Dillenburger et al., 2012) and the use of internet-based media as a training platform (Granspeeshe et al., 2010). Still there would seem to be a limitation on the SESS effectiveness in delivering CPD on behaviour analysis. One would suspect the limited opportunity to practice ABA methods in Irish classroom due to its low level of acceptance and (lack of) official status would effect the participants' knowledge of covered material over time.

Intensive training in applied behaviour analysis would require commitment by participant and provider both to engage in a longitudinal programme with a stated goal of learner expertise as the ultimate goal. This programme would have limited appeal to teachers choosing to specialize in ASD education due to the perception of the science as a methodology for teaching students with autism. However, these staff members will have transferable skills for working with challenging behaviours, response to intervention programmes, and functional behavioral assessments among others. Enriched professional development opportunities such as this will increase the skills level of individual teachers, school staffs, and the Irish teaching profession as a whole.

8.3. Recommendations

8.3.1. Data Collection on CPD activities of teachers

Presently, the Irish government, through its agents at the Department of Education and Skills and the Teaching Council of Ireland, does not collect data regarding the

participation of individual teachers in continuous professional development activities. There is presently no requirement for teachers to be active in CPD at any stage of their career other than the first year of employment following initial teacher education. The literature and results of this research would support the adoption of an individual professional development plan for in-career teachers in Irish schools regardless of level and specialization (e.g. SEN, ICT, mathematics, primary). Lack of a database of professional development has restricted research and reform efforts to date in the Irish education sector (Price, Waterhouse, and Cooper LLC, 2012).

Collecting data on participation in CPD by individual teachers will provide several important statistical databases for the DES. Firstly, DES officials will be able to access areas of specialization or expertise for teachers based on their participation in CPD throughout their careers. Secondly, this record can be part of the vetting process for promotion of teachers to administrative position (e.g. inspectorate, SENO) or as principal/ deputy principal teacher posts.

Should the data collection include learner outcome information from specific training initiatives, the government would then be able to perform cost benefit analysis of individual CPD providers and programmes. This information could also serve as a tool to adapt CPD modules to affect the greatest learner outcomes.

8.3.2. Teacher licensure

Linked to the recommendation for the collection of CPD data is the endorsement of a teacher licensure system being adopted in the Republic of Ireland. Again little use of data, in this case, regarding numbers of students entering and qualified teachers exiting Irish ITE has resulted in poor planning practices by government agencies (Sahlberg, 2012).

In the past teachers received training in a teachers' college and then proceeded to engage in the profession with little or no encouragement to continue their own education as a means of learning new pedagogical approaches or update use of classroom technology, for instance. At this time, there is little financial incentive for teachers to pursue advanced degrees or CPD modules.

A new system of teacher certification could increase teacher participation in CPD/postgraduate education by requiring a set amount of professional development over the term of the certification period (e.g. recertification required every 5 years). Professional development points can be earned through participation and passing an exit assessment for each CPD module or higher education course. Under such a system, each teacher is responsible for maintaining a licensure portfolio with the record of achievement being approved by the DES. Similar systems are in place in several US states, teachers are required to recertify every five years by acquiring set amount of CPD credits (Massachusetts Department of Education, 2011). These credits are financially incentivized as they result in increased pay as part of the further education entitlement.

A system of recertification based on professional development and postgraduate attainment would be similar to the existing system for other professions. The Irish government through the Department of Health requires doctors and nurses to register their CPD to maintain their licensure periodically throughout the career. Similarly, the international qualification for behaviour analysts requires BCBA's submit CPD information for requalification on a regular basis. Outside of education, qualifications tend to need to be maintained by evidencing completion of CPD and remaining knowledgeable of changes in the field (e.g. accountants, financial advisors).

The information gathered from this system will serve to inform important departmental decisions as noted above. Additionally, the system of recertification can be used to identify teachers worthy of mentorship roles based on skill acquisition

and training experiences. A system of recognizing individual teachers accomplishments in CPD activities, such as specialist endorsement, would further incentivize teacher's participation in career building activities.

8.3.3. Special educational needs teacher qualification

A final but equally relevant recommendation is for the increased focus on special education training during initial teacher education. While Irish government policy has been for inclusive education departmental practice has supported the continued existence of separate special schools for those who opt out of or are not suited to mainstream schools (Ware et al., 2009). With reality in Ireland today being a spectrum of educational placements for students with special educational needs, teachers in all settings need to have significant training in the education of students with different learning needs.

Currently, teachers of students with SEN need no special training in special education, a primary teaching qualification is sufficient for employment in any setting. Teachers are deemed suitably trained to work with students with severe general learning disabilities by having completed a programme focused entirely on primary mainstream teaching (O'Gorman & Drudy, 2010). The call for highly trained educators includes the students with SEN. They too deserve highly trained teachers in special education pedagogy. Furthermore, with inclusive classrooms becoming the norm in Irish society, every teacher should have a high level of understanding of the special needs of the learners who may be in their class.

Many American higher education institutions have begun to offer dual certification tracts for future teachers of students with SEN in mainstream settings (Morehead State University, 2013; University of Massachusetts, 2013). These programmes combine regular education teacher training with a full specialization in the education of students with SEN. Graduates have found these credentials highly sought after by employers upon graduation (Morehead State University, 2013).

8.3.4. Systemic changes to teacher education

Globally, recent education reform has been driven by the goal of improved learner outcomes (Darling-Hammond, 2005) and gains in national ranking on comparative standards of education systems (Darling-Hammond, 2010). Motivated by these ‘league tables’ several countries, including the US and Finland, have sought to improve the standing of their respective systems. The methods used by each example are quite different and warrant review by potential followers.

Much interest has been paid to the recent evolution of the Finnish education system to the pinnacle of international comparisons (Sahlberg, 2011; Darling-Hammond, 2010). The Finnish model of education, particularly teacher education, has been the subject of much research.

According to Sahlberg (2011) the Finnish education system does not employ standardized student testing, has no rigorous school inspection protocols, but rather relies chiefly on the recruitment, training, and retention of the brightest secondary students in the country. Future educators must have exemplary grades and extra-curricular activities throughout secondary school and then pass a written exam on assigned professional readings of pedagogy. Together with mock teaching observation and an entrance interview, students are thoroughly vetted into programmes for academic ability and a commitment to the teaching profession.

In a report conducted at the behest of the Irish Department of Education and Skills, Professor Sahlberg recommended changes to the system of initial teacher education in the country (Sahlberg, 2012). Among the systemic changes was the establishment of fewer and larger institutes of higher education for teacher training. This clustering in six centres for ITE would provide a critical mass to facilitate educational research and specialization. The role of educational research was accentuated by this report in its call for research-based education of future teachers, increased research agendas in

the institutions carried out by teacher educators and their students, and the classroom teacher development as reflective practitioners through action research.

In accordance with practice in Finland, the report calls for the establishment of model schools where teaching practice and field experience is to take place. Each institution of ITE would establish ties to local schools that provide exemplary experiences for student teachers. Current practice in Ireland is for the student to recruit a school/ teacher willing to act in the capacity of student teaching host.

The Minister for Education has announced government intention to enact many of the recommendations proposed in the Sahlberg (2012) report (Department of Education and Skills, 2012). The reform of initial teacher education in Ireland has been moved forward through this recent activity. The actual implementation of these reforms will require budgetary considerations as well as changes within the education sector which have both proven to be obstacles to past reform efforts in the country. This effort only superficially addresses the nature of teacher in-career professional development in Ireland.

Greater reform of the CPD systems for Irish educators has been indicated (Teaching Council of Ireland, 2011b) but without detail regarding government financial support for this process or a definitive action plan for long-term progress. The provision of professional development under a new scheme can take several forms including that practiced in the US or the system employed in Finland. The former system is more centralized and relies on standardized test results of student learning as evidence of improved teaching (Darling-Hammond, 2010) than the latter (Sahlberg, 2011).

Under the Finnish system CPD is provided on a local level through local education agencies (LEA) that are sensitive to the needs of local teachers and students (Sahlberg, 2011). In addition to the results evidenced through international ranking of the Finnish education system, the locally driven impetus of this model of CPD is

attractive for the Irish education sector. The regional control fits with decentralized government movement of recent years as well as the increasing role of local governance. However, the implementation of this system would be problematic without major reforms of the structure of Irish education. Unlike most other nations (e.g. UK, US, Canada, and Finland), Ireland does not currently have a system of LEAs from which to base the aforementioned CPD system. The lack of local education structure would make dissemination of training next to impossible without organization coming from central government and the Department of Education and Skills. Implementation of a Finnish model of teacher CPD would necessitate the establishment of local education authorities in the form of county boards of education.

Several similarities between the Sahlberg (2012) recommendations and recent developments in teacher education practice in the US (Speck & Knipe, 2005; Darling-Hammond, 2005) can be seen. A common feature of the two paradigms for professional development is the establishment of model schools for student teachers to experience exemplary practices. In the US these schools are used for student-teacher placements as well as in career training programmes delivered by university faculty (Darling-Hammond, 2005). Used in this way and in combination with local institutes of teacher education, teacher CPD can be responsive to local needs as recommended in the Finnish model (Sahlberg, 2011).

Irish universities could lead the development and provision of teacher CPD as recommended in the recent report by Prof. Sahlberg (2012) through the regional clusters of teacher education centres. Recommended changes to the teacher certification requirements, including the mandate for teachers obtaining a master's degree, is standard practice in some US states (Massachusetts Department of Education, 2011) as well as in Finland (Sahlberg, 2011). The process of obtaining a master's degree could be part of the required CPD system as proposed.

US reform of teacher education and professional development for teachers has been driven by the collection of data supporting the efficacy of these efforts. The Irish education sector needs to develop this culture of data collection and evidence-driven decision making in order to track the effects of reform efforts into the future. Planned changes appear to be warranted to improve learner outcomes but without data collected during the process, improvements to the education system might be overlooked. Comparison data from current practice and post-reform results can serve to indicate positive changes to the teacher education system in Ireland.

8.4. Limitations and future research

The current survey, along with the key findings detailed above contained several limitations of interest. The research instrument in question was developed specifically for this dissertation and the research accompanying it. This being so, the survey instrument was created by the dissertation author and has not been validated as an effective measure of knowledge of the topics (i.e. autism spectrum disorders, challenging behavior, and applied behavior analysis). Additionally, the piloting of the survey was carried out with a very small sample ($n=7$) and thus feedback was restricted.

For the main survey data collection, assessment was carried out partially by convenience sampling. Participants were recruited at professional development venues prior to and during training activities on the topic of autism spectrum disorders in Irish classrooms. This limited sampling method was partially offset through a targeted email campaign for participants. While schools were targeted based on the existence of ASD specific classes, it was impossible to solicit teachers by name, as this data was unavailable to the researcher. Participation rates among the email population may have been greater had the names of teachers of students with ASD been known.

One survey item used improper wording. Item #38 reads: *True or false: Behaviour, defined as the interaction of an organism with its environment, can be measured in various ways, including: frequency, duration, latency, and force.* With regard to dimensions of behaviour suitable for measurement, ‘force’ of behaviour is infrequently found in the literature. There are instances when ‘intensity’ is considered as part of the analysis of some challenging behaviours (Alberto & Troutman, 2009; LaVigna & Willis, 2005) and the term ‘magnitude’ is favoured by other researchers (J. O. Cooper et al., 2007). The use of ‘force’ rather than a more common behavioural dimension may have caused confusion and elicited incorrect responses.

The survey conducted for this dissertation required participants report past training in target areas of professional knowledge, along with similar reports of professional development and initial teacher education training provider information. These self-reports were crucial in the statistical analysis of the data collected. Reliance on unsubstantiated evidence is problematic without independent verification (Boyle, Lamprianou, & Boyle, 2005). Inaccuracies may arise from selective memory (e.g. erroneously attributing training undertaken to the wrong providing agency) or from exaggeration of professional development engagement. Although this criticism of self-reported data collection seems to dominate the literature, Desimone (2009) argues the direct research on the issue shows greater reliability of self-reported data than generally expressed in anecdotal literature.

The analysis of the data collected in this research may have been more robust had the comparison groups been defined differently. While the SESS has been noted in the literature to be the most significant source of SEN support in Ireland (Banks & Smyth, 2011; Price, Waterhouse, and Coopers LLB, 2012), limiting the statistical analysis to participants who had CPD in the content area through the SESS or other providers left a large segment of survey responses unaccounted for. The group designated as other did not include teachers without training in the area in question. While this had little effect on the data for the first two sections (i.e. ASD & CB),

approximately 110 responses to survey items were attached to teachers with no training in ABA. A cursory review of these responses indicated to the researcher that the significance of these responses was minimal due to similarly high error rates. However, in the future an alternative method of analysis that includes the responses from this group would strengthen the overall analysis.

The small sample sizes in the groups based on CPD training providers was also a limiting factor in addressing the statistical significance of teacher self-reported knowledge and experience level of teachers as originally intended by the researcher. The level of teaching experience and teacher knowledge of the content areas could be analyzed through future research efforts.

Despite the support of self-reported data (Boyle et al., 2005) there is a need for more empirically robust evidence to be collected in professional development participation. Although direct observation and interviewing is time consuming, adding this data to survey results will strengthen causal relationships in teacher CPD reform efforts (Desimone, 2009). Currently in the context of teacher training and professional development for teachers in Ireland, a database of teacher training participation is non-existent (Egan, 2004; Price, Waterhouse, and Coopers LLB, 2012). This fact makes it necessary to use teacher self-reported data for the research when cost factors (e.g. manpower and finances) make alternative data collection methods unfeasible. Future research of this type may consider utilizing a pre-training test of knowledge and the direct testing of CPD content as a follow-up activity for all participants.

A final issue for consideration is the completion rate for the survey instrument developed for this research. The total response (n=165) does not reflect the rate of response for all forty-eight items included in the survey. Analysis indicates 8.5% (n=14) of all respondents failed to respond to any items after agreeing to participate. While there was some fluctuation in response rate throughout the demographic and professional development sections, participation appeared to follow a trend throughout the content knowledge sections. In future use, this survey may be altered

to reduce total time needed for completion by eliminating some of the demographic items requested of respondents. The online version of this survey can be modified to force completion of the full survey by each respondent, although fewer responses may be collected as a result of teachers dropping out before completion.

As the survey was directed to teachers involved in the education of students with autism spectrum disorders, it is not surprising to find this section to have the highest completion rate of approximately 75% (i.e. each question had a different response rate). Each subsequent section has lower average response rate (i.e. 70% for challenging behaviour section, 58% for applied behaviour analysis section). Several possible explanations for this phenomenon may apply in this situation.

Since this survey was direct towards teachers in the area of ASD, these professionals may have been dissuaded from continuing the survey once it was obvious that further topics were being explored beyond basic information regarding ASD. Perhaps connected to this point, time constraints may have deterred teachers from continuing beyond these initial phases of the survey. Another possible factor to limit responses to later sections could be the complexity of the subject matter. The survey was arranged to move from basic information to more intricate material within sections. Also the final content area, applied behaviour analysis, was dedicated to a specific discipline. This specialized subject matter may have discouraged further participation for some respondents.

8.5. Conclusion

The current research does not support the findings of the evaluation of SESS training programmes that reports teacher satisfaction (Price, Waterhouse, and Coopers LLB, 2012) as evidence of effective CPD provision by this provider. The results of the current research indicate the knowledge of subject specific content to be inadequate for teachers having participated in SESS courses. The absence of empirical data on teacher CPD efficacy perpetuates the continued use of ineffective methods. Providers

of professional development services to Irish educators should be required to collect, analyze, and report data to validate their programmes.

The planned changes to Irish teacher education and professional development need to be implemented without delay (The Teaching Council of Ireland, 2011a; The Teaching Council of Ireland, 2011b). The literature in the field for SEN (Dounavi & Dillenburger, 2013; Odom, Collet-Klingenberg, Rogers, & Hatton, 2010; Parsons et al., 2009) and teacher education (Clarke et al., 2012; Cochran-Smith, 2005; Darling-Hammond, 2005) advocate for evidence-based practice in classrooms to improve learner outcomes. This requirement for evidence-based practice needs to be extended to those providing teacher training. While higher education has recently been subject to an accreditation process in Ireland (The Teaching Council of Ireland, 2011a), continuous professional development in Ireland has no such oversight.

Although the Department of Education finances and reviews training modules produced by the SESS, neither they nor the SESS review the effectiveness of these courses (Banks & Smyth, 2011; Egan, 2004; Price, Waterhouse, and Coopers LLB, 2012). And yet the dissemination of these modules continues despite budgetary restriction being implemented in all sectors of Irish society (O'Gorman & Drudy, 2010). Without empirical data to support the training provision and teaching models in Irish ASD education comparisons to ABA-based interventions is impossible.

The empirical support for the use of applied behaviour analysis with students with autism continues to grow (Dawson et al., 2010; Eikeseth, Smith, Jahr, & Eldevik, 2007; Fein et al., 2013) while data is absent from interventions for students with ASD supported by Irish official policy (Parsons et al., 2009; The Task Force on Autism, 2001). Thorough collection of data relating to CPD participant outcomes as well as application of learning to classroom practice, with follow through to measure improved learner outcomes for students will help justify financial and policy support for any educational methodology.

Finally, Irish students with SEN, and particularly ASD, require highly qualified teachers with knowledge of the field prior to appointment to classroom positions. Qualifications in ASD and SEN need to become available in Irish initial teacher education programmes as a prerequisite to employment in the SEN sector.

References

- ABA Ireland. (2014). *Qualifications*. Retrieved February 12, 2014, from http://www.aba-ireland.com/?page_id=1389
- Ainscow, M. (2005). Developing inclusive education systems: What are the levers for change? *Journal of Educational Change*, 6(2), 109-124.
- Ainscow, M. (2007). Towards a more inclusive education system: Where next for special schools? In R. Cigman (Ed.), *Included or excluded? The challenge of the mainstream for some SEN children*, pp. 128-139. London: Routledge.
- Ainscow, M., & Miles, S. (2009). Developing inclusive education systems: How can we move policies forward. *Manchester, UK: University of Manchester*,
- Alberto, P. A., & Troutman, A. C. (2009). *Applied behavior analysis for teachers* (8th ed.). Upper Saddle River, NJ USA: Pearson Education, Inc.
- American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders: DSM-III* (III ed.) American Psychiatric Association.
- American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders: DSM-III-R* (III- Revised ed.) American Psychiatric Association.
- American Psychiatric Association. (1994). *Diagnostic and statistics manual of mental disorders* (IV- International Version ed.). Washington DC, USA: American Psychiatric Association.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders: DSM-IV-TR®* (IV-Text Revised ed.) American Psychiatric Association.
- American Psychiatric Association. (2013). *Diagnostic and statistics manual 5* (5th ed.) American Psychiatric Association.

- Arbuckle, C., & Little, E. (2004). Teachers' perceptions and management of disruptive classroom behaviour during the middle years (years five to nine). *Australian Journal of Educational & Developmental Psychology*, 4(1), 59-70.
- Armstrong, T. (2012). *Neurodiversity in the classroom: Strength-based strategies to help students with special needs succeed in school and life* ASCD.
- Asperger, H. (1944). Die „Autistischen psychopathen“ im kindesalter. *European Archives of Psychiatry and Clinical Neuroscience*, 117(1), 76-136.
- Asperger, H., & Frith, U. T. (1991). 'Autistic psychopathy' in childhood.
- Association for Behavior Analysis International. (2014). *ABA international*. Retrieved February 16, 2014, from <http://www.abainternational.org>
- Autism Society of America. (2014). Retrieved January 31, 2014, from <http://www.autism-society.org/about-us/>
- Autism Speaks. (2009). *Introduction of landmark autism treatment acceleration act*. Retrieved February 13, 2014, from <http://www.autismspeaks.org/about-us/press-releases/autism-speaks-hails-introduction-landmark-autism-treatment-acceleration-act>
- Autism Speaks. (2013). *Consolidated financial statements 2012 and 2011*. New York: Elliot Horowitz and Company, Certified Public Accountants.
- Autism Speaks. (2013). Fiscal impact of autism insurance reform.
- Autism Speaks. (2014). *About us*. Retrieved January 31, 2014, from <http://www.autismspeaks.org/about-us>
- Autism Speaks. (2014). *Light it up blue*. Retrieved February 1, 2014, from <http://liub.autismspeaks.org/welcome>
- Autism Speaks. (2014). Mission statement.

- Autism Speaks. (2014). *State mandated insurance coverage for autism treatments*. Retrieved February 12, 2014, from <http://www.autismspeaks.org/advocacy/states>
- Autistic Self Advocacy Network. (2014). *2014 joint letter to the supporters of autism speaks*. Retrieved January 30, 2014, from <http://autisticadvocacy.org/2014/01/2013-joint-letter-to-the-sponsors-of-autism-speaks/>
- Ayllon, T., & Michael, J. (1959). The psychiatric nurse as a behavioral engineer1. *Journal of the Experimental Analysis of Behavior*, 2(4), 323-334.
- Baer, D. M., Wolf, M. M., & Risley, T. R. (1968). Some current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis*, 1, 91--97.
- Bailey, A., Le Couteur, A., Gottesman, I., Bolton, P., Simonoff, E., Yuzda, E., et al. (1995). Autism as a strongly genetic disorder: Evidence from a British twin study. *Psychological Medicine*, 25(01), 63-77.
- Bailey, S., Ridley, J., & Greenhill, B. (2010). Challenging behaviour: A human rights approach. *Advances in Mental Health and Intellectual Disabilities*, 4(2), 20-26.
- Baird, G., Simonoff, E., Pickles, A., Chandler, S., Loucas, T., Meldrum, D., et al. (2006). Prevalence of disorders of the autism spectrum in a population cohort of children in south Thames: The special needs and autism project (SNAP). *The Lancet*, 368, 210-215.
- Baker, D. L. (2011). *The politics of neurodiversity: Why public policy matters*, Lynne Rienner Publishers.
- Baker, P., & Daynes, S. (2010). Outcome measurement for people with intellectual disability who present challenging behaviour. *Advances in Mental Health and Intellectual Disabilities*, 4(2), 13-19.
- Ball, D. L., & Forzani, F. M. (2009). The work of teaching and the challenge for teacher education. *Journal of Teacher Education*, 60(5), 497-511.

- Banks, J., & Smyth, E. (2011). *Continuous professional development among primary teachers in Ireland*. Dublin, Ireland: The Teaching Council of Ireland.
- Barnhill, G. P. (2005). Functional behavioral assessment in schools. *Intervention in School & Clinic, 40*(3), 131-135.
- Baron-Cohen, S. (2009). Autism: The empathizing-systemizing (E-S) theory. *Annals of the New York Academy of Science, 1156: The Year in Cognitive Neuroscience 2009*, 68-80.
- Baron-Cohen, S., Scott, F., Allison, C., Williams, J., Bolton, P., Matthews, F. E., et al. (2009). Prevalence of autism-spectrum conditions: UK school-based population study. *The British Journal of Psychiatry, 194*, 500-509.
- Behavior Analysts Certification Board. (2007). *Autism task list*. Littleton, CO USA: Behavior Analysts Certification Board.
- Behavior Analysts Certification Board. (2012). *Supervisor training curriculum outline*. Retrieved February 20, 2014, from http://www.bacb.com/Downloadfiles/supervisor_curriculum.pdf
- Behavior Analysts Certification Board. (2012). *Task list* (Fourth ed.). Littleton, CO USA: Behavior Analysts Certification Board.
- Behavior Analysts Certification Board. (2013). *Guidelines for responsible conduct for behavior analysts*. Littleton, CO USA: Behavior Analysts Certification Board.
- Behavior Analysts Certification Board. (2013). *Registered behavior technician (RBT) task list*. Littleton, CO USA: Behavior Analysts Certification Board.
- Behavior Analysts Certification Board. (2014). *About BACB credentials*. Retrieved February 13, 2014, from <http://www.bacb.com/index.php?page=4>
- Behavior Analysts Certification Board. (2014). *BACB approved coursework at international universities for BCBA and BCaBA courses*. Retrieved February 15, 2014, from <http://www.bacb.com/index.php?page=100475>

- Behavior Analysts Certification Board. (2014). *Behavior analyst licensure/certification statutes*. Retrieved February 20, 2014, from <http://www.bacb.com/index.php?page=100170>
- Bertrand, J., Mars, A., Boyle, C., Bove, F., Yeargin-Allsopp, M., & Decoufle, P. (2001). Prevalence of autism in a United States population: The brick township, New Jersey, investigation. *Pediatrics*, 108, 1155-1161.
- Bettelheim, B. (1967). *Empty fortress* Simon and Schuster.
- Blume, H. (1997). *Autism & the Internet: Or it's the wiring, stupid*. Retrieved February 3, 2014, from http://www.kind-autismus.ch/download/Autism_Harvey_Blum.pdf
- Borko, H. (2004). Professional development and teacher learning: Mapping the terrain. *Educational Researcher*, 33(8), 3-15.
- Boyle, B., Lamprianou, I., & Boyle, T. (2005). A longitudinal study of teacher change: What makes professional development effective? Report of the second year of the study. *School Effectiveness and School Improvement*, 16(1), 1-27.
- Bradshaw, C. P., Mitchell, M. M., & Leaf, P. J. (2010). Examining the effects of school wide positive behavioral interventions and supports on student outcomes results from a randomized controlled effectiveness trial in elementary schools. *Journal of Positive Behavior Interventions*, 12(3), 133-148.
- British Medical Association. (2006). Child and adolescent mental health: A guide for health care professionals. *England: British Medical Association*,
- Brown, L. (2013). Co-opting the movement: Autism speaks, John Elder Robison, and complicity in oppression.
- Brownell, M. T., Ross, D. D., Colón, E. P., & McCallum, C. L. (2005). Critical features of special education teacher preparation a comparison with general teacher education. *The Journal of Special Education*, 38(4), 242-252.

- Buschbacher, P. W., & Fox, L. (2003). Understanding and intervening with the challenging behavior of young children with autism spectrum disorders. *Language, Speech, and Hearing Services in Schools, 34*, 217-227.
- Callahan, K., Shukla-Mehta, S., Magee, S., & Wie, M. (2010). ABA versus TEACCH: The case for defining and validating comprehensive treatment models in autism. *Journal of Autism and Developmental Disorders, 40*, 74-88.
- Callan Institute for Positive Behaviour Support. (2014). *Website*. Retrieved February 26, 2014, from <http://www.callaninstitute.ie/about-callan-institute>
- Carr, E. G., Dunlap, G., Horner, R. H., Koegel, R. L., Turnbull, A. P., Sailor, W., et al. (2002). Positive behavior support: Evolution of an applied science. *Journal of Positive Behavior Interventions, 4*(1), 4-20.
- Carr, E. G., & Durand, V. M. (1985). Reducing behavior problems through functional communication training. *Journal of Applied Behavior Analysis, 18*, 111-126.
- CDC. (2009). *Prevalence of autism spectrum disorders- autism and developmental disabilities monitoring network, United States, 2006* MMWR 58 No. SS-10. Atlanta, GA USA: Center for Disease Control, United States of America.
- CDC. (2012). *Prevalence of autism spectrum disorders- autism and developmental disabilities monitoring network, 14 sites, United States, 2008* No. MMWR 61 No.SS-3. Atlanta, GA USA: Center for Disease Control, United States of America.
- Center for Positive Behavior Intervention & Support. (2009). *Is school-wide positive behavior support an evidence-based practice? A research summary*. Retrieved 28 January, 2010, from <http://www.pbis.org/research/default.aspx>
- Center for Positive Behavior Intervention & Support. (2014). *Positive behavior interventions and supports in schools*. University of Connecticut: Center for Positive Behavior Intervention & Support.

- Chamak, B. (2008). Autism and social movements: French parents' associations and international autistic individuals' organizations. *Sociology of Health & Illness*, 30(1), 76-96.
- Chance, P. (1999). Thorndike's puzzle boxes and the origins of the experimental analysis of behavior. *Journal of Experimental Analysis of Behavior*, 72(3), 433-440.
- Charlton, J. I. (1998). *Nothing about us without us without us: Disability, oppression and empowerment* University of California Pr.
- Chung, K., Jung, W., Yang, J., Ben-Itzhak, E., Zachor, D. A., Furniss, F., et al. (2012). Cross cultural differences in challenging behaviors of children with autism spectrum disorders: An international examination between Israel, South Korea, the United Kingdom, and the United States of America. *Research in Autism Spectrum Disorders*, 6(2), 881-889.
- Cidav, Z., Marcus, S. C., & Mandell, D. S. (2012). Implications of childhood autism for parental employment and earnings. *Pediatrics*, 129(4), 617-623.
- Cigman, R. (2007). Editorial introduction. In R. Cigman (Ed.), *Included or excluded? the challenge of the mainstream for some SEN children* (pp. xv-xxviii). London: Routledge.
- Cipani, E. (2004). *Punishment on trial*. Reno, Nevada: Context Press.
- Clarke, M., Lodge, A., & Shevlin, M. (2012). Evaluating initial teacher education programmes: Perspectives from the republic of Ireland. *Teaching and Teacher Education*, 28(2), 141-153.
- Clements, J. (2005). *People with autism behaving badly: Helping people with ASD move on from behavioral and emotional challenges* (First ed.). London: Jessica Kingsley Publishers.
- Clements, J., & Zarkowska, E. (2000). *Behavioural concerns & autistic spectrum disorders: Explanations and strategies for change* (First ed.). London: Jessica Kingsley Publishers.

- Cochran-Smith, M. (2005). The new teacher education: For better or for worse? *Educational Researcher*, 34(7), 3-17.
- Cole, T. (2003). Policies for positive behaviour management. In C. Tilstone, & R. Rose (Eds.), *Strategies to promote inclusive practice*, 67-83. London: RoutledgeFalmer.
- Cone, J. D. (1997). Issues in functional analysis in behavioral assessment. *Behaviour Research and Therapy*, 35(3), 259-275.
- Constantino, J. N., Zhang, Y., Frazier, T., Abbacchi, A. M., & Law, P. (2010). Sibling recurrence and the genetic epidemiology of autism. *The American Journal of Psychiatry*, 167(11), 1349-1356.
- Conway, P. F., & Murphy, R. (2013). A rising tide meets a perfect storm: New accountabilities in teaching and teacher education in Ireland. *Irish Educational Studies*, 32(1), 11.
- Conway, P. F., Murphy, R., Rath, A., & Hall, K. (2009). *Learning to teach and its implications for the continuum of teacher education: A nine-country cross-national study*. University College Cork, Ireland: The Teaching Council of Ireland.
- Coolahan, J. (2007). *A review paper on thinking and politics relating to teacher education in Ireland*. Dublin, Ireland: The Teaching Council of Ireland.
- Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). *Applied behavior analysis* (Second ed.). Upper Saddle River, New Jersey: Pearson Education, Inc.
- Cooper, P. (2001). *We can work it out*. Ilford, Essex: Barnado's.
- Cooper, P., & Jacobs, B. (2011). *Evidence of best practice models and outcomes in the education of children with emotional disturbance/ behavioural difficulties* Report No. 7. Trim, Co. Meath, Ireland: National Council for Special Education.
- Cooper, P., & Lovey, J. (1999). Early interventions in emotional and behavioural difficulties: The role of nurture groups. In M. Nind, K. Sheehy & K. Simmons

- (Eds.), *Inclusive education: Learners and learning contexts* (pp. 47-57). London: David Fulton Publishers.
- Cowan, R. J., & Allen, K. D. (2007). Using naturalistic procedures to enhance learning in individuals with autism: A focus on generalized teaching within the school setting. *Psychology in the Schools*, 44(7), 701-715.
- Cumine, V., Leach, J., & Stevenson, G. (2000). *Autism in the early years: A practical guide*. London: David Fulton Publishers.
- Curtis, T., Dellar, R., Leslie, E., & Watson, B. (2001). *Mad pride: A celebration of mad culture* Spare Change Books, London.
- Cutler, E. (2004). Thorn in my pocket: Temple Grandin's mother tells the family story. Future Horizons, Arlington Texas.
- Daniels, H., Visser, J., Cole, T., & de Reybekill, N. (1999). *Emotional and behavioural difficulties in mainstream schools*. Nottingham: Department for Education and Employment.
- Darling-Hammond, L. (2005). Teaching as a profession: Lessons in teacher preparation and professional development. *The Phi Delta Kappan*, 87(3), 237-240.
- Davey, B. J., & Lignugaris/Kraft, B. (2005). A practical approach to functional behavioral assessment in a public (state supported) school: Successes and limitations. *Emotional and Behavioural Difficulties*, 10(4), 255-268.
- Dawson, M. (2009). The misbehaviour of behaviourists: Ethical challenges to the autism-ABA industry.
- Dawson, G., Rogers, S., Munson, J., Smith, M., Winter, J., Greenson, J., et al. (2010). Randomized, controlled trial of an intervention for toddlers with autism: The early start Denver model. *Pediatrics*, 125(1), e17-23.

- Dawson, G., Webb, S., Schellenberg, G. D., Dager, S., Friedman, S., Aylward, E., et al. (2002). Defining the broader phenotype of autism: Genetic, brain, and behavioral perspectives. *Development and Psychopathology*, 14(3), 581-611.
- Denne, L. D., Hastings, R. P., Hughes, C., Bovell, V., & Redford, L. (2011). Developing a competence framework for ABA and autism: What can we learn from others? *European Journal of Behavior Analysis*, 12(1), 217-230.
- Department for Education and Employment. (1997). *Excellence for all children: Meeting special educational needs*. London: Department for Education and Employment, UK.
- Department of Education and Science. (1992). *Education for a changing world: Green paper on education* Report No. 8969. Dublin: Government of Ireland.
- Department of Education and Science. (1995). *Charting our future education: White paper on education*. Dublin: Government of Ireland.
- Department of Education and Science. (1997). *Extra personal vacation: Rule 58 of the rules for national schools* Circular No. 37/97. Dublin: Government of Ireland.
- Department of Education and Science. (2000). *Restricted recognition of a teacher trained outside the state* Circular No. 25/00. Ireland: Department of Education and Science.
- Department of Education and Science. (2005). *Special education circular 02/05*. Dublin: Government of Ireland.
- Department of Education and Science. (2007). *Inclusion of students with special educational needs: Post-primary guidelines*. Dublin: Government of Ireland.
- Department of Education and Skills. (2014). *Special needs education*. Retrieved March 1, 2014, from <http://www.education.ie/en/The-Education-System/Special-Education/>

- Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward better conceptualizations and measures. *Educational Researcher*, 38(3), 181-199.
- Dewey, J. (1916). *Democracy and education: An introduction to the philosophy of education*. New York: Macmillan.
- Diamant, M. (2010). Senate confirms controversial autism self-advocate to national disability council.
- Dillenburger, K. (2000). Functional assessment and analysis. In M. Davies (Ed.), *Encyclopedia of social work*. Oxford: Blackwell Publishers.
- Dillenburger, K. (2011). The emperor's new clothes: Eclecticism in autism treatment. *Research in Autism Spectrum Disorders*, 5(3), 1119-1128.
- Dillenburger, K., Jordan, J. A., McKerr, L., Devine, P., & Keenan, M. (2013). Awareness and knowledge of autism and autism interventions: A general population survey. *Research in Autism Spectrum Disorders*, 7(12), 1558-1567.
- Dillenburger, K., & Keenan, M. (2009). None of the A's in ABA stands for autism: Dispelling the myths. *Journal of Intellectual & Developmental Disabilities*, 34(2), 193-195.
- Dillenburger, K., Keenan, M., Gallagher, S., & McElhinney, M. (2004). Parent education and home-based behaviour analytic intervention: An examination of parents' perceptions of outcome. *Journal of Intellectual and Developmental Disability*, 29(2), 119-130.
- Dillenburger, K., Keenan, M., Doherty, A., Byrne, T., & Gallagher, S. (2012). ABA-based programs for children diagnosed with autism spectrum disorder: Parental and professional experiences at school and at home. *Child & Family Behavior Therapy*, 34(2), 111-129.
- Dillenburger, K., Keenan, M., Doherty, A., Byrne, T., & Gallagher, S. (2010). Living with children diagnosed with autistic spectrum disorder: Parental and professional views. *British Journal of Special Education*, 37, 13-23.

- Dixon, D. R., Vogel, T., & Tarbox, J. (2012). A brief history of functional analysis and applied behavior analysis. In J. L. Matson (Ed.), *Functional assessment for challenging behavior*. 1st ed., pp. 3-24. Tarzana, CA USA: Springer Science and Business Media.
- Doggett, R. A., Edwards, R. P., Moore, J. W., Tingstrom, D. H., & Wilczynski, S. M. (2001). An approach to functional assessment in general education classroom settings. *School Psychology Review*, 30(3), 313-324.
- Donnellan, A., LaVigna, G., Negri-Shoultz, N., & Fassbender, L. (1988). *Progress without punishment: Effective approaches for learners with behavior problems* (First ed.). New York: Teachers College Press.
- Doody, C. (2009). Multi-element behaviour support as a model for the human rights based approach for working with people with intellectual disabilities and behaviours that challenge. *British Journal of Learning Disabilities*, 37, 293--299.
- Dorsey, M. F., Weinburg, M., & Guidi, M. M. (2009). The case for licensure of applied behavior analysis. *Behavior Analysis in Practice* 2(1), 53-58.
- Dounavi, K., & Dillenburger, K. (2013). Behaviour analysis and evidence-based education. *Effective Education*, 2(4), 191-207.
- Downs, R. C., & Downs, A. (2010). Practices in early intervention for children with autism: A comparison with the national research council recommended practices. *Education and Training in Autism and Developmental Disabilities*, 45(1), 150-159.
- Drudy, S., & Kinsella, W. (2009). Developing an inclusive system in a rapidly changing European society. *International Journal of Inclusive Education*, 13(6), 647-663.
- Dunlap, G., & Kincaid, D. (2001). The widening world of functional assessment: Comments on four manuals and beyond. *Journal of Applied Behavior Analysis*, 34(3), 365-377.

- Dunlap, G., Strain, P. S., Fox, L., Carta, J. J., Conroy, M., Smith, B. J., et al. (2006). Prevention and intervention with young children's challenging behavior: Perspectives regarding current knowledge. *Behavioral Disorders*, 32(1)
- Dunlop, A., Tait, C., Leask, A., Glashan, L., Robinson, A., & Marwick, H. (2009). The autism toolbox. *The Scottish Government, Edinburgh*,
- Egan, E. (2004). Continuing professional development of teachers. *Teacher Education in the Republic of Ireland: Retrospect and Prospect*, pp. 11-18.
- Eikeseth, S. (2010). Examination of qualifications required of an EIBI professional. *European Journal of Behavior Analysis*, 2, 239-246.
- Eikeseth, S., Smith, T., Jahr, E., & Eldevik, S. (2002). Intensive behavioral treatment at school for 4-to 7-year-old children with autism A 1-year comparison controlled study. *Behavior Modification*, 26(1), 49-68.
- Eikeseth, S., Smith, T., Jahr, E., & Eldevik, S. (2007). Outcome for children with autism who began intensive behavioral treatment between ages 4 and 7 a comparison controlled study. *Behavior Modification*, 31(3), 264-278.
- Emerson, E. (1995). *Challenging behaviour: Analysis and intervention in people with learning disabilities* (First ed.). Cambridge, UK: Cambridge University Press.
- Emerson, E. (2001). *Challenging behaviour: Analysis and intervention in people with severe intellectual disabilities* (Second ed.). Cambridge, UK: Cambridge University Press.
- Emerson, E., Kiernan, C., Alborz, A., Reeves, D., Mason, H., Swarbrick, R., et al. (2001). The prevalence of challenging behaviors: A total population study. *Research in Developmental Disabilities*, 22(1), 77-93.
- European Association for Behavior Analysis (2009). *Endorsement of BACB credentials*, Cert. No. 0109. London.

- Farrell, P. (2000). The impact of research on developments in inclusive education. *International Journal of Inclusive Education*, 4(2), 153-162.
- Fein, D., Barton, M., Eigsti, I., Kelley, E., Naigles, L., Schultz, R., et al. (2013). Optimal outcome in individuals with a history of autism. *Journal of Child Psychology and Psychiatry*, 54(3), 195-205.
- Ferster, C. (1966). The repertoire of the autistic child in relation to principles of reinforcement. *Methods of research in psychotherapy*, pp. 312-333. Springer.
- Ferster, C., & DeMyer, M. K. (1961). The development of performances in autistic children in an automatically controlled environment. *Journal of Chronic Diseases*, 13(4), 312-345.
- Florian, L. (2010). Special education in the era of inclusion: The end of special education or a new beginning? *The Psychology of Education Review*, 34(7), 22-29.
- Florian, L., & Linklater, H. (2010). Preparing teachers for inclusive education: Using inclusive pedagogy to enhance teaching and learning for all. *Cambridge Journal of Education*, 40(4), 369-386.
- Folstein, S., & Rutter, M. (1977). Infantile autism: A genetic study of 21 twin pairs. *Journal of Child Psychology and Psychiatry*, 18(4), 297-321.
- Fombonne, E. (2001). Is there an epidemic of autism? *Pediatrics*, 107, 411-413.
- Fombonne, E. (2003). The prevalence of autism. *Journal of the American Medical Association*, 289(1), 87-89.
- Fombonne, E. (2005). Epidemiology of autistic disorder and other pervasive developmental disorders. *Journal of Clinical Psychiatry*, 66(10), 3-8.
- Forlin, C., & Chambers, D. (2011). Teacher preparation for inclusive education: Increasing knowledge but raising concerns. *Asia-Pacific Journal of Teacher Education*, 39(1), 17-32.

- Foxx, R. (1982a). *Increasing behaviors of persons with severe retardation and autism* (First ed.). Champaign, Illinois: Research Press.
- Foxx, R. (1982b). *Decreasing behaviors of persons with severe retardation and autism* (First ed.). Champaign, Illinois: Research Press.
- Frazier, T., Youngstrom, E., Speer, L., Embacher, R., Law, P., Constantino, J., et al. (2012). Validation of proposed DSM-5 criteria for autism spectrum disorder. *Journal of American Academy of Child & Adolescent Psychiatry*, 51(1), 28-40.
- Freeman, R., Eber, L., Anderson, C., Irwin, L., Horner, R., Bounds, M., et al. (2006). Building inclusive school cultures using school-wide PBS: Designing effective individual support systems for students with significant disabilities. *Research and Practice for Persons with Severe Disabilities*, 31(1)
- Frith, U. (1991). *Autism and Asperger syndrome* Cambridge University Press.
- Fuchs, D., & Fuchs, L. S. (1998). Competing visions for educating students with disabilities inclusion versus full inclusion. *Childhood Education*, 74(5), 309-316.
- Fuchs, D., Fuchs, L. S., & Stecker, P. M. (2010). The "blurring" of special education in a new continuum of general education placements and services. *Exceptional Children*, 76(3), 301-323.
- Fuller, P. R. (1949). Operant conditioning of a vegetative human organism. *The American Journal of Psychology*, 62(4), 587-590.
- Gable, R., A., & Hendrickson, J. M. (2000). Strategies for maintaining positive behavior change stemming from functional behavioral assessment in schools. *Education and Treatment of Children*, 23(3), 286-293.
- Ganz, M. L. (2007). The lifetime distribution of the incremental societal costs of autism. *Archives of Pediatrics & Adolescent Medicine*, 161(4), 343.
- Generation Rescue. (2014). Retrieved February 2, 2014, from <http://www.generationrescue.org/about/background/>

- Ghaziuddin, M., Tsai, L., & Ghaziuddin, N. (1992). Brief report: A comparison of the diagnostic criteria for Asperger syndrome. *Journal of Autism and Developmental Disorders*, 22(4), 643-649.
- Gillberg, C., & Wing, L. (1999). Autism: Not an extremely rare disorder. *Acta Psychiatrica Scand*, 99, 399-406.
- Glenn, M., McDonagh, C., Sullivan, B., Roche, M., & Morgan, M. (2012). *Practise-based research encompassing professional development project*. Dublin: The Teaching Council of Ireland.
- Godlee, F., Smith, J., & Marcovitch, H. (2011). Wakefield's article linking MMR vaccine and autism was fraudulent. *British Medical Journal*, 342, 64-66.
- Government of Ireland. (1996). Education Act 1996. Dublin.
- Government of Ireland. (2002). *Preparing teachers for the 21st century: Report of the working group on primary preservice teacher education*. Dublin: Stationery Office.
- Governement of Ireland. (2004). Education for Persons with Special Educational Needs (EPSEN) Act. Dublin.
- GovTrack.us. (2009). *Autism treatment acceleration act 2009*. Retrieved February 13, 2014, from <https://www.govtrack.us/congress/bills/111/s819#summary>
- Grandin, T. (2006). *Thinking in pictures: And other reports from my life with autism*. Bloomsbury Publishing.
- Granspeesheh, D., Tarbox, J., Dixon, D. R., Peters, C. A., Thompson, K., & Kenser, A. (2010). Evaluation of an elearning tool for training behavioral therapists in academic knowledge of applied behavior analysis. *Research in Autism Spectrum Disorders*, 4, 11-17.
- Grant, L., & Evans, A. (1994). *Principles of behavior analysis* (First ed.). New York: Harper Collins.

- Green, G. (2008). Single-case research methods for evaluating treatments for autism spectrum disorders. In S. Luce, D. Mandell, C. Mazefsky & W. Seibert (Eds.), *Autism in Pennsylvania: What lies ahead?* (pp. 69-81) The Pennsylvania House of Representatives, Pennsylvania USA.
- Green, L. A., Fein, D., Modahl, C., Feinstein, C., Waterhouse, L., & Morris, M. (2001). Oxytocin and autistic disorder: Alterations in peptide forms. *Biological Psychiatry*, 50(8), 609-613.
- Gresham, F., M. (2003). Establishing the technical adequacy of functional behavior assessment: Conceptual and measurement challenges. *Behavioral Disorders*, 28(3), 282-298.
- Gresham, F., M. (2004). Relevance of functional behavioral assessment research for school-based interventions and positive behavior support. *Research in Developmental Disabilities*, 25, 19-37.
- Gresham, F., M., Watson, T. S., & Skinner, C. H. (2001). Functional behavioral assessment: Principles, procedures, and future directions. *School Psychology Review*, 30(2), 156-171.
- Grey, I. M., Honan, R., McClean, B., & Daly, M. (2005). Evaluating the effectiveness of teacher training in applied behaviour analysis. *Journal of Intellectual Disabilities*, 9(3), 209-227.
- Griffin, S., & Shevlin, M. (2011). *Responding to special educational needs: An Irish perspective* (2nd ed.). Dublin, Ireland: Gill & MacMillan.
- Grindle, C. F., Kovshoff, H., Hastings, R. P., & Remington, B. (2009). Parents' experiences of home-based applied behavior analysis programs for young children with autism. *Journal of Autism and Developmental Disorders*, 39, 42-56.
- Gross, L. (2009). A broken trust: Lessons from the vaccine-autism wars. *PLoS Biology*, 7(5), Retrieved from:

<http://www.plosbiology.org/article/info%3Adoi%2F10.1371%2Fjournal.pbio.1000114#pbio-1000114-g004>.

Gurrieri, F., & Neri, G. (2009). Defective oxytocin function: A clue to understanding the cause of autism? *BMC Medicine*, 7(1), 63.

Hagopian, L. P., & Boelter, E. W. (2012). *Applied behavior analysis and neurodevelopmental disorders: Overview and summary of scientific support*. Retrieved April 10, 2012, from <http://kennedykrieger.org/patient-care-programs/inpatient-programs/neurobehavioral-unit-nbu/applied-behavioral-analysis>

Happé, F. (2011). Criteria, categories, and continua: Autism and related disorders in DSM5. *Journal of the American Academy of Child & Adolescent Psychiatry*, 50(6), 540-542.

Hargreaves, I., Lewis, J., & Speers, T. (2003). *Towards a better map: Science, the public and the media* Economic and Social Research Council Swindon, UK.

Harmon, A. (2004). How about not 'curing' us, some autistics are pleading. *New York Times*, 20, 1.

Harmon, A. (2010). Nominee to disability council is lightning rod for dispute on views of autism.

Hart, J., E., & Malian, I. (2013). A statewide survey of special education directors on teacher preparation and licentiate in autism spectrum disorders: A model for university and state collaboration. *International Journal of Special Education*, 28(1), 4-13.

Hartley, S., Sikora, D., & McCoy, R. (2008). Prevalence and risk factors of maladaptive behaviour in young children with autistic disorder. *Journal of Intellectual Disability Research*, 52(10), 819-829.

Hartnell, N. (2010). Multi-disciplinary approaches to pupil behaviour in school- the role of evaluation in service delivery. *Educational Psychology in Practice*, 26(2), 187-203.

- Harvey, A. C., Harvey, M. T., Kenkel, M. B., & Russo, D. C. (2010). Funding of applied behavior analysis services: Current status and growing opportunities. *Psychological Services, 7*(3), 202.
- Harvey, M. W., Yssel, N., Bauserman, A. D., & Merbler, J. B. (2010). Preservice teacher preparation for inclusion an exploration of higher education teacher-training institutions. *Remedial and Special Education, 31*(1), 24-33.
- Hayes, J., Casey, L., Williamson, R., Black, T., & Winsor, D. (2013). Educators' readiness to teach children with autism spectrum disorders in an inclusive classroom. *The Researcher, 25*(1), 67--78.
- Healy, O., & Lydon, S. (2013). Early intensive behavioural intervention in autism spectrum disorders.
- Heilker, P. (2012). Autism, rhetoric, and whiteness. *Disability Studies Quarterly, 32*(4)
- Hendrix Reynolds, S. (2009). The autism treatment acceleration act and the autism sandbox. *The Huffington Post*. Retrieved from: http://www.huffingtonpost.com/shelley-hendrix-reynolds/the-autism-treatment-acce_b_206613.html
- Herbert, M. R. (2005). Autism: A brain disorder, or a disorder that affects the brain? *Clinical Neuropsychiatry, 2*(6), 354-379.
- Herscovitch, B., Roscoe, E. M., Libby, M. E., Bourret, J. C., & Ahearn, W. H. (2009). Procedures for identifying precursors to problem behaviors. *Journal of Applied Behavior Analysis, 42*, 697-702.
- Hertz-Picciotto, I., & Delwiche, L. (2009). The rise in autism and the role of age at diagnosis. *Epidemiology, 20*(1), 84-90.
- Hill, R. (2013). Do the ASD characters on television adequately reflect the reality of autism? *The Autism Daily Newscast*. Retrieved from: <http://www.autismdailynewscast.com/do-the-asd-characters-on-television-adequately-reflect-the-reality-of-autism/2776/robertahill/>

- Hirschfield, P. J., & Celinska, K. (2011). Beyond fear: Sociological perspectives on the criminalization of school discipline. *Sociology Compass*, 5(1), 1-12.
- Holland, M., Conte, L., Krakow, R., & Colin, L. (2011). Unanswered questions from the vaccine injury compensation program: A review of compensated cases of vaccine-induced brain injury. *Pace Environmental Law (PELR) Review*, 28(2), 11-34.
- Hollander, E., Bartz, J., Chaplin, W., Phillips, A., Sumner, J., Soorya, L., et al. (2007). Oxytocin increases retention of social cognition in autism. *Biological Psychiatry*, 61(4), 498-503.
- Holt-Damant, K., Guaralda, M., Taylor Gomez, M., & Nicollet, C. (2013). Urban jungle: Making cities healthy places for Australians with neurodiversity. *Conference Proceedings of the 6th Making Cities Livable Conference, in Conjunction with the Sustainable Transformation Conference*, pp. 116-132.
- Holtmann, M., Bolte, S., & Poustka, F. (2007). Autism spectrum disorders: Sex differences in autistic behaviour domains and coexisting psychopathology. *Developmental Medicine & Child Neurology*, 49, 361-366.
- Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in special education. *Exceptional Children*, 71(2), 165-179.
- Horner, R. H., Sugai, G., & Anderson, C. M. (2010). Examining the evidence base for school-wide positive behavior support. *Focus on Exceptional Children*, 42(8), 1-14.
- Howard, J. S., Sparkman, C. R., Cohen, H. G., Green, G., & Stanislaw, H. (2005). A comparison of intensive behavior analytic and eclectic treatments for young children with autism. *Research in Developmental Disabilities*, 26(4), 359-383.
- Howlin, P. (1998). *Children with autism and Asperger syndrome: A guide for practitioners and carers* (First ed.). Chichester, UK: John Wiley & Sons.

- Huffington Post. (2014). Night of too many stars: Comedy central airs autism benefit.
- Hughes, J. C., & Shook, G. L. (2007). Training and certification of behavior analysts in Europe: Past, present, and future challenges. *European Journal of Behaviour Analysis*, 2(8), 239-249.
- Humphrys, T. (2012, February 3, 2012). Core connection. *The Irish Examiner*,
- Hviid, A., Stellfeld, M., Wohlfahrt, J., & Melbye, M. (2003). Association between thimerosal-containing vaccine and autism. *JAMA: The Journal of the American Medical Association*, 290(13), 1763-1766.
- Indiana State Legislature. (2001). Code 27-8-14.2: Insurance Coverage for Pervasive Developmental Disorders, State Law U.S.C. (2001).
- Ingram, K., Lewis-Palmer, T., & Sugai, G. (2005). Function-based intervention planning: Comparing the effectiveness of FBA function-based and non-function-based intervention plans. *Journal of Positive Behavior Interventions*, 7(4), 224--236.
- Irish Autism Action. (2010). *Therapies and interventions*. Retrieved February 16, 2014, from <http://www.autismireland.ie/therapies-interventions/>
- Irish Autism Action. (2014). Retrieved January 31, 2014, from <http://www.autismireland.ie/760/>
- Irish Independent. (2014). Boyzone singer honoured for €4m autism fundraisers.
- Irish National Teachers Organization. (2004). *Gender imbalance in primary teaching: A discussion document on the demise of the male primary teacher?* Dublin: Irish National Teachers Organization (INTO).
- Irish National Teachers Organization. (2004). *Managing challenging behaviour: Guidelines for teachers*. Dublin, Ireland: Irish National Teachers Organization.
- Irish Society for Autism. (2014). Retrieved January 31, 2014, from <http://autism.ie>

- Iwata, B. A., Dorsey, M. F., Slifer, K. J., Bauman, K. E., & Richman, G. S. (1994). Toward a functional analysis of self-injury. *Journal of Applied Behavior Analysis*, 27(2), 197-209.
- Iwata, B. A., Dorsey, M. F., Slifer, K. J., Bauman, K. E., & Richman, G. S. (1982). Toward a functional analysis of self-injury. *Analysis and Intervention in Developmental Disabilities*, 2(1), 3-20.
- Jaarsma, P., & Welin, S. (2012). Autism as a natural human variation: Reflections on the claims of the neurodiversity movement. *Health Care Analysis*, 20(1), 20-30.
- Jarvis, J. (2007). 'Jigsawing it together': Reflections on deaf pupils and inclusion. In R. Cigman (Ed.), *Included or excluded? The challenge of the mainstream for some SEN children* (pp. 42-50) Routledge.
- Johnson, D. D., Johnson, B., Farenga, S. J., & Ness, D. (2005). *Trivializing teacher education: The accreditation squeeze*. Lanham, Maryland: Rowman & Littlefield Publishing Incorporated.
- Johnston, J. M., & Pennypacker, H. S. (1993). *Strategies and tactics of human behavioral research*. Psychology Press. Oxford, UK.
- Jones, G. (2002). *Educational provision for children with autism and Asperger syndrome: Meeting their needs* (First ed.). London: David Fulton Publishers.
- Jordan, C. J. (2010). Evolution of autism support and understanding via the world wide web. *Intellectual and Developmental Disabilities*, 48(3), 220-227.
- Jordan, R., & Cornick, M. (2000). *Special educational needs of children with autism-unit 5: Challenging behaviour* No. Module code 11 11475/11 05542). Birmingham UK: The University of Birmingham, UK.
- Jordan, R., Jones, G., & Murray, D. (1998). *Educational interventions for children with autism: A literature review of recent and current research*. Research Report No.77. Norwich, UK: Department for Education and Employment, UK.

- Kanner, L. (1943). Autistic disturbance of affective contact. *Nervous Child*, 2, 217-250.
- Kapp, S. K., Gillespie-Lynch, K., Sherman, L. E., & Hutman, T. (2013). Deficit, difference, or both? autism and neurodiversity. *Developmental Psychology*, 49(1), 59.
- Kates-McElrath, K., Agnew, M., Axelrod, S., & Bloh, C. L. (2007). Identification of behavioral function in public schools and a clarification of terms. *Behavioral Interventions*, 22, 47-56.
- Kaufman, J. (2007). Ransom-note ads about children's health are cancelled. *New York Times*. 20 December 2007.
- Kaye, J. A., del Mar Melero-Montes, M., & Jick, H. (2001). Mumps, measles, and rubella vaccine and the incidence of autism recorded by general practitioners: A time trend analysis. *British Medical Journal*, 322, 460-463.
- Kearns, H., & Shevlin, M. (2006). Initial teacher preparation for special educational needs: Policy and practice in the north and south of Ireland. *Teacher Development*, 10(01), 25-42.
- Keenan, M., & Dillenburger, K. (2000). *Behaviour analysis: A primer* Celtic Fringe Production.
- Keenan, M., & Dillenburger, K. (2011). When all you have is a hammer...: RTCs and hegemony in science. *Research in Autism Spectrum Disorders*, 5, 1-13.
- Keenan, M., & Dillenburger, K. (2012). *Behavior analysis: A primer* (Electronic Book ed.) Celtic Fringe Production.
- Keenan, M., Dillenburger, K., Moderato, P., & Hanns-Rudiger, R. (2010). Science for sale in a free market economy: But at what price? ABA and the treatment of autism in Europe. *Behavior and Social Issues*, 19, 126-143.
- Keenan, M., & Gallagher, S. (2002). *Northern Ireland task group report on autism: P.E.A.T. response*

- Keenan, M., Kerr, K. P., & Dillenburger, K. (2000). *Parents' education as autism therapists: Applied behaviour analysis in context*. Jessica Kingsley Publishers.
- Kelley, E., Naigles, L., & Fein, D. (2010). An in-depth examination of optimal outcome children with a history of autism spectrum disorder. *Research in Autism Spectrum Disorders*, 4, 526-538.
- Kelly, A., Carey, S., McCarthy, S., & Coyle, C. (2007). Challenging behaviour: Principals' experience of stress and perception of the effects of challenging behaviour on staff in special schools in Ireland. *European Journal of Special Needs Education*, 22(2), 161-181.
- Kentucky Board of Applied Behavior Analysts. (2011). *Applied behavior analyst licensure*. Retrieved February 13, 2014, from <http://aba.ky.gov/Form%20Library/Application%20for%20Licensure.pdf>
- Kern, L., Hilt, A., & Gresham, F. (2004). An evaluation of the functional behavioral assessment process used with students with or at risk for emotional and behavioral disorders. *Education and Treatment of Children*, 27(4), 440-448.
- Kerr, K. P., Mulhern, F., & McDowell, C. (2000). Applied behaviour analysis: It works, it's positive; now what's the problem? *Early Childhood Development and Care*, 163, 125-131.
- Kim, Y. S., Leventhal, B. L., Koh, Y., Fombonne, E., Laska, E., Lim, E., et al. (2011). Prevalence of autism spectrum disorders in a total population sample. *American Journal of Psychiatry*, 168(9), 904-912.
- Kirkland, A. (2012). Credibility battles in the autism litigation. *Social Studies of Science*, 42(2), 237-261.
- Kleiman, G. M. (2004). *Meeting the need for high quality teachers: E-learning solutions*. Washington DC: US Department of Education.
- Knapp, M., Romeo, R., & Beecham, J. (2007). The economic consequences of autism in the UK. *Foundation for People with Learning Disabilities*.

- Kogan, M. D., Blumberg, S. J., Schieve, L. A., Boyle, C. A., Perrin, J. M., Ghandour, R. M., et al. (2009). Prevalence of parent-reported diagnosis of autism spectrum disorder among children in the US, 2007. *Pediatrics*, 124, 1395-1403.
- Kras, J. F. (2010). The “Ransom notes” affair: When the neurodiversity movement came of age. *Disability Studies Quarterly*, 30(1)
- Lambe, J. (2007). Northern Ireland student teachers' changing attitudes towards inclusive education during initial teacher training. *International Journal of Special Education*, 22(1), 59-71.
- LaVigna, G. W., & Willis, T. J. (2005). Episodic severity: An overlooked dependent variable in the application of behavior analysis to challenging behavior *Journal of Positive Behavior Interventions*, 7(1), 47-56.
- Leaf, R. B., Taubman, M. T., & McEachin, J. (2008). *Sense and nonsense in the behavioral treatment of autism: It has to be said*. New York: DRL Books.
- Leekam, S., Libby, S., Wing, L., Gould, J., & Gillberg, C. (2000). Comparison of ICD-10 and Gillberg's criteria for Asperger syndrome. *Autism*, 4(1), 11-28.
- Legislature of Louisiana. (2013). Act no. 351: Behavior Analyst Practice Act.
- Leslie, J. C., & Tierney, K. J. (2013). Behaviour analysis in Ireland. *Irish Journal of Psychology*, 34, 156-162.
- Lindsay, G. (2007). Educational psychology and the effectiveness of inclusive education/mainstreaming. *British Journal of Educational Psychology*, 77(1), 1-24.
- London, E., & Etzel, R. A. (2000). The environment as an etiological factor in autism: A new direction for research. *Environmental Health Perspectives*, 108(3), 401-404.

- Lord, C., & Jones, R. (2012). Annual research review: Re-thinking the classification of autism spectrum disorders. *Journal of Child Psychology and Psychiatry*, 53(5), 490-509.
- Lord, C., & Bishop, S. L. (2010). Autism spectrum disorders. *Social Policy Report*, 24(2), 3-16.
- Lord, C., Rutter, M., Goode, S., Heemsbergen, J., Jordan, H., Mawhood, L., et al. (1989). Autism diagnostic observation schedule: A standardized observation of communicative and social behavior. *Journal of Autism and Developmental Disorders*, 19(2), 185-212.
- Lord, C., Rutter, M., & Le Couteur, A. (1994). Autism diagnostic interview-revised: A revised version of a diagnostic interview for caregivers of individuals with possible pervasive developmental disorders. *Journal of Autism and Developmental Disorders*, 24(5), 659-685.
- Lord, C., Schopler, E., & Revicki, D. (1982). Sex differences in autism. *Journal of Autism and Developmental Disorders*, 12(4), 317-330.
- Lotter, V. (1966). Epidemiology of autistic conditions in young children. *Social Psychiatry*, 1(3), 124-135.
- Lovaas, O. I. (1987). Behavioral treatment and normal educational and intellectual functioning in young autistic children. *Journal of Consulting and Clinical Psychology*, 55(1), 3-9.
- Low, C. (2007). A defense of moderate inclusion and an end of ideology. In R. Cigman (Ed.), *Included or excluded? the challenge of the mainstream for some SEN children* (pp. 3-14). London: Routledge.
- Lowe, K., Allen, D., Jones, E., Brophy, S., Moore, K., & James, W. (2007). Challenging behaviours: Prevalence and topographies. *Journal of Intellectual Disability Research*, 51(8), 625-636.

- Lyons, C. W., & O'Connor, F. (2006). Constructing an integrated model of the nature of challenging behaviour: A starting point for intervention. *Emotional and Behavioural Difficulties*, 11(3), 217-232.
- Maag, J. W. (2001). Rewarded by punishment: Reflections on the disuse of positive reinforcement in schools. *Exceptional Children*, 67(2), 173-186.
- Maag, J. W., & Larson, P., J. (2004). Training a general education teacher to apply functional assessment *Education and Treatment of Children*, 27(1), 26-31.
- Mackenzie, R., & Watts, J. (2011). Is our legal, health care and social support infrastructure neurodiverse enough? how far are the aims of the neurodiversity movement fulfilled for those diagnosed with cognitive disability and learning disability? *Tizard Learning Disability Review*, 16(1), 30-37.
- Macleod, G. (2006). Bad, mad or sad: Constructions of young people in trouble and implications for interventions. *Emotional and Behavioural Difficulties*, 11(3), 155-167.
- Madsen, K. M., Lauritsen, M. B., Pedersen, C. B., Thorsen, P., Plesner, A., Andersen, P. H., et al. (2003). Thimerosal and the occurrence of autism: Negative ecological evidence from Danish population-based data. *Pediatrics*, 112(3), 604-606.
- Maginnis, K. (2008). *Independent review of autism services*. Belfast, Northern Ireland: Department of Health.
- Maglione, M. A., Gans, D., Das, L., Timbie, J., & Kasari, C. (2012). Nonmedical interventions for children with ASD: Recommended guidelines and further research needs. *Pediatrics*, 130(2), S169-178.
- Maine Administrators of Service for Children with Disabilities. (2000). Report of the MADSEC autism task force.
- Malott, R. W., & Suarez, E. A. (2004). *Elementary principles of behavior* (Fifth ed.). Upper Saddle River, New Jersey: Prentice Hall.

- Malott, M. E. (2004). Toward the globalization of behavior analysis. *The Behavior Analyst / MABA*, 27(1), 25-32.
- Mandell, D. S., & Salzer, M. S. (2007). Who joins support groups among parents of children with autism? *Autism*, 11(2), 111-122.
- Martinez, S. (2009). A system gone berserk: How are zero-tolerance policies really affecting schools? *Preventing School Failure*, 53(3), 153-158.
- Massachusetts Department of Education. (2011). *Licensure help on-line: Determining the requirements for a particular license*. Retrieved 14 July, 2013, from <https://gateway.edu.state.ma.us/elar/licensurehelp/LicenseRequirementsCriteriaPageControl.ser>
- Massachusetts General Law (1972). Chapter 766: Massachusetts Special Education Law. .
- Massachusetts General Law (2010). Chapter 175: Insurance
Section 47AA: Coverage for Diagnosis and Treatment of Autism Spectrum Disorders, Amendment U.S.C.
- Matson, J. L., & Kozlowski, A. M. (2011). The increasing prevalence of autism spectrum disorders. *Research in Autism Spectrum Disorders*, 5, 418-425.
- Matson, J. L., & Minshawi, N. F. (2007). Functional assessment of challenging behavior: Towards a strategy for applied settings. *Research in Developmental Disabilities*, 28, 353-361.
- Matson, J. L., & Nebel-Schwalm, M. (2007). Assessing challenging behaviors in children with autism spectrum disorders: A review. *Research in Developmental Disabilities*, 28, 567-579.
- Matson, J. L., Rieske, R. D., & Tureck, K. (2011). Additional considerations for the early detection and diagnosis of autism: Review of available instruments. *Research in Autism Spectrum Disorders*, 5, 1319-1326.

- Matson, J. L., Adams, H. L., Williams, L. W., & Rieske, R. D. (2013). Why are there so many unsubstantiated treatments in autism? *Research in Autism Spectrum Disorders*, 7(3), 466-474.
- Matson, J. L., Bamburg, J. W., Cherry, K. E., & Paclawskyj, T. R. (1999). A validity study on the questions about behavioral function (QABF) scale: Predicting treatment success for self-injury, aggression, and stereotypies. *Research in Developmental Disabilities*, 20(2), 163-175.
- Matson, J. L., Fodstad, J. C., & Rivet, T. T. (2009). The relationship of social skills and problem behaviors in adults with intellectual disability and autism or PDD-NOS. *Research in Autism Spectrum Disorders*, 3(1), 258-268.
- Matson, J. L., Kozlowski, A. M., Worley, J. A., Shoemaker, M. E., Sipes, M., & Horovitz, M. (2011). What is the evidence for environmental causes of challenging behaviors in persons with intellectual disabilities and autism spectrum disorders? *Research in Developmental Disabilities*, 32(2), 693-698.
- Matson, J. L., Mahan, S., Hess, J. A., Fodstad, J. C., & Neal, D. (2010). Progression of challenging behaviors in children and adolescents with autism spectrum disorders as measured by the autism spectrum disorders-problem behaviors for children (ASD-PBC). *Research in Autism Spectrum Disorders*, 4(3), 400-404.
- Maurice, C. (1994). *Let me hear your voice: A family's triumph over autism*. Random House Digital, Inc.
- Maurice, C. (2003). The autism wars. In *Exceptional Children: An Introduction to Special Education, Second edition*. Heward, W. ed. 490-492.
- McCarthy, J., Hemmings, C., Kravariti, E., Dworzynski, K., Holt, G., Bouras, N., et al. (2010). Challenging behavior and co-morbid psychopathology in adults with intellectual disability and autism spectrum disorders. *Research in Developmental Disabilities*, 31(2), 362-366.
- McCarthy, P., Fitzgerald, M., & Smith, M. A. (1984). Prevalence of childhood autism in Ireland. *Irish Medical Journal*, 77(4), 129-130.

- McCormack, P. (2012). Story from the Republic of Ireland. *The Current Repertoire, Newsletter of the Cambridge Centre for Behavioural Studies*. Fall 2012.
Retrieved from: <http://www.behavior.org/resources/674.pdf>
- McCready, L. T., & Soloway, G. B. (2010). Teachers' perceptions of challenging behaviours in model inner city schools. *Emotional and Behavioural Difficulties*, 15(2), 111-123.
- McEachin, J. J., Smith, T., & Lovaas, O. I. (1993). Long-term outcome for children with autism who received early intensive behavioral treatment. *American Journal of Mental Retardation*, 97, 359-372.
- McGillicuddy, S., & O'Donnell, G. M. (2013). Teaching students with autism spectrum disorder in mainstream post-primary schools in the republic of Ireland. *International Journal of Inclusive Education*, (ahead-of-print), 1-22.
- McPartland, J. C., Reichow, B., & Volkmar, F. R. (2012). Sensitivity and specificity of proposed DSM5 diagnostic criteria for autism spectrum disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*, 51(4), 368-383.
- McPhilemy, C., & Dillenburger, K. (2013). Parents' experiences of applied behaviour analysis (ABA)-based interventions for children diagnosed with autistic spectrum disorder. *British Journal of Special Education*, 40(4), 154-161.
- Meegan, S., & MacPhail, A. (2006). Inclusive education: Ireland's education provision for children with special educational needs. *Irish Educational Studies*, 25(1), 53-62.
- Merrell, K. W., & Walker, H. M. (2004). Deconstructing a definition: Social maladjustment versus emotional disturbance and moving the EBD field forward. *Psychology in the Schools*, 41(8), 899-910.
- Mesibov, G. B., & Shea, V. (2011). Evidence-based practices and autism. *Autism*, 15(1), 114-133.

- Ministers' Autism Spectrum Disorders Reference Group. (2007). *Making a difference for students with autism spectrum disorders in Ontario schools*. Ontario, Canada: Government of Canada.
- Mitchell, D. (2008). *What really works in special and inclusive education: Using evidence-based teaching strategies*. London: Routledge.
- Moeyaert, M., Ferron, J. M., Beretvas, S. N., & Van den Noortgate, W. (2014). From a single-level analysis to a multilevel analysis of single-case experimental designs. *Journal of School Psychology, 52*(2), 191-211.
- Morehead State University. (2013). *Special education, learning and behavioral disorders and middle grades (5-9) certification area of concentration, bachelor of arts*. Retrieved 14 July, 2013, from [https://www.moreheadstate.edu/Academic-Programs/ECES/Special-Education,-Learning-and-Behavioral-Disorders-and-Middle-Grades-\(5-9\)-Certification-Area-of-Concentration,-Bachelor-of-Arts/](https://www.moreheadstate.edu/Academic-Programs/ECES/Special-Education,-Learning-and-Behavioral-Disorders-and-Middle-Grades-(5-9)-Certification-Area-of-Concentration,-Bachelor-of-Arts/)
- Moreno, G. (2010). No need to count to ten: Advocating for the early implementation of the functional behavioural assessment in addressing challenging behaviours. *Emotional and Behavioural Difficulties, 15*(1), 15-22.
- Mulick, J., & Butter, E. M. (2002). Educational advocacy for children with autism. *Behavioral Interventions, 17*(2), 57-74.
- Munn, P., & Lloyd, G. (2005). Exclusion and excluded pupils. *British Educational Research Journal, 31*(2), 205-221.
- Murphy, G. H., Beadle-Brown, J., Wing, L., Gould, J., Shah, A., & Holmes, N. (2005). Chronicity of challenging behaviours in people with severe intellectual disabilities and/or autism: A total population sample. *Journal of Autism and Developmental Disorders, 35*(4), 405-418.
- National Autism Association. (2014). *National autism association*. Retrieved March 10, 2014, from <http://nationalautismassociation.org>

- National Autistic Society. (2008). *'I exist' campaign.*, 2014, from <http://www.autism.org.uk/get-involved/campaign-for-change/learn-more/our-campaigns/past-campaigns/i-exist/i-exist-campaign-in-england/i-exist-campaign-demands-in-england.aspx>
- National Autistic Society. (2010). *Don't write me off.* Retrieved February 6, 2014, from <http://www.dontwritemeoff.org.uk>
- National Autistic Society. (2013). *Push for action.* Retrieved February 6, 2014, from <http://www.autism.org.uk/Get-involved/autism-strategy.aspx>
- National Autistic Society. (2014). Retrieved January 31, 2014, from <http://www.autism.org.uk/news-and-events/about-the-nas.aspx>
- National Behaviour Support Service. (2013). *The NBSS in schools: Promoting and supporting behaviour for learning.* Navan, Co. Meath, Ireland: National Behaviour Support Service.
- National Behaviour Support Service. (2014). *NBSS website.* Retrieved February 22, 2014, from <http://www.nbss.ie/home/about-us>
- National Council for Special Education. (2012). *The education of students with challenging behaviours arising from severe emotional disturbance/ behavioural disorders.* No. 3. Navan, Co. Meath, Ireland: National Council for Special Education.
- National Council for Special Education. (2013). *Full list of special classes 2012-2013.* Retrieved May, 2012, from www.ncse.ie/uploads/1/Full_List_of_Special_Classes_2012-13.pdf
- National Council for Special Education. (2013). *Supporting students with special educational needs in schools* Policy Advice Paper No.4. Trim, Co. Meath, Ireland: National Council for Special Education (NCSE).
- National Council for Special Education. (2013). *Website.* Retrieved February 27, 2014, from http://www.ncse.ie/about_us/About_the_NCSE.asp

- National Educational Psychological Service. (2007). *Special educational needs: A continuum of support*. Dublin, Ireland: Department of Education and Science.
- National Research Council. (2001). *Educating children with autism*. Washington, D.C.: The National Academies Press.
- National Standards Project. (2009). *National standards project report*. Randolph, Massachusetts: National Autism Center.
- Neef, N. A., & Peterson, S., M. (2007). Functional behavior assessment. In J. O. Cooper, T. E. Heron & W. L. Heward (Eds.), *Applied behavior analysis* (Second ed., pp. 500--524). Upper Saddle River, New Jersey: Pearson Education.
- Ne'eman, A. (2009). The future (and the past) of autism advocacy, or why the ASA's magazine, the advocate, wouldn't publish this piece. *Disability Studies Quarterly*, 30(1).
- New York State Department of Health. (1999). *Clinical practice guidelines: Report of the recommendations. autism/ pervasive developmental disorders assessment and intervention for young children (age 0-3 years)*. No. 4215. New York:
- Newcomer, L., & Lewis, T. J. (2004). Functional behavioral assessment: An investigation of assessment reliability and effectiveness of function-based interventions. *Journal of Emotional and Behavioral Disorders*, 12(3), 168-174.
- Newschaffer, C. J., Croen, L. A., Daniels, J., Giarelli, E., Grether, J. K., Levy, S. E., et al. (2007). The epidemiology of autism spectrum disorders. *Annual Review of Public Health*, 28(1), 235-258.
- Newschaffer, C. J., & Curran, L. K. (2003). Autism: An emerging public health problem. *Public Health Reports*, 118(5), 393.
- No Child Left Behind*. (2001). US Public Law 107-110. US Congress.
- Norris, S. (2006). *Potential causes of autism /spectrum disorders* No. PRB 05-87E. Ottawa, Ontario, Canada: Parliamentary Information and Research Service, Library of Parliament.

- O'Reilly, M., Rispoli, M., Davis, T., Machalicek, W., Lang, R., Sigafoos, J., et al. (2010). Functional analysis of challenging behavior in children with autism spectrum disorders: A summary of 10 cases. *Research in Autism Spectrum Disorders*, 4(1), 1-10.
- Obiakor, F. E., Harris, M., Mutua, K., Rotatori, A., & Algozzine, B. (2012). Making inclusion work in general education classrooms. *Education and Treatment of Children*, 35(3), 477-490.
- Odom, S. L., Collet-Klingenberg, L., Rogers, S. J., & Hatton, D. D. (2010). Evidence-based practices in interventions for children and youth with autism spectrum disorders. *Preventing School Failure: Alternative Education for Children and Youth*, 54(4), 275-282.
- Ofsted. (1999). *Principles into practice: Effective education for pupils with emotional and behavioural difficulties*. Office for Standards in Education: HM Stationery Office.
- Ofsted. (2005). *Managing challenging behaviour*. Office for Standards in Education: HM Stationery Office.
- O'Gorman, E., & Drudy, S. (2010). Addressing the professional development needs of teachers working in the area of special education/inclusion in mainstream schools in Ireland. *Journal of Research in Special Educational Needs*, 10(s1), 157-167.
- O'Leary, S. (2011). *Supporting behaviour management in schools for students with behavioural, emotional, and/or social difficulties*. Ireland: Special Education Support Service.
- Oliver, C., McClintock, K., Hall, S., Smith, M., Dagnan, D., & Stenfert-Kroese, B. (2003). Assessing the severity of challenging behaviour: Psychometric properties of the challenging behaviour interview. *Journal of Applied Research in Intellectual Disabilities*, 16(1), 53-61.

- O'Neill, R. E., Horner, R. H., Albin, R. W., Sprague, J. R., Storey, K., & Newton, J. S. (1997). *Functional assessment and program development for problem behavior: A practical handbook* (Second ed.). Pacific Grove, California: Brooks/Cole Publishing Company.
- Organisation for Economic Co-operation and Development. (1999). *Inclusive education at work: Students with disabilities in mainstream schools*. Paris: OECD.
- Organisation for Economic Co-operation and Development. (2005). *Teachers matter: Attracting, developing and retaining effective teachers*. Paris: OECD.
- Ortega, F., & Choudhury, S. (2011). 'Wired up differently': Autism, adolescence and the politics of neurological identities. *Subjectivity*, 4(3), 323-345.
- O'Ruairc, T. (2013). Current directions in teacher education and curriculum reform in Ireland. pp. 1-7.
- Osher, D., Bear, G. G., Sprague, J. R., & Doyle, W. (2010). How can we improve school discipline? *Educational Researcher*, 39(1), 48-58.
- Osterling, J. A., Dawson, G., & Munson, J. A. (2002). Early recognition of 1-year-old infants with autism spectrum disorder versus mental retardation. *Development and Psychopathology*, 14(2), 239-251.
- O'Sullivan, C. (2010, July 15, 2010). Proposals will end the teaching of ABA, parents claim. *Irish Examiner*, 15 July, 2010. Retrieved from: <http://www.irishexaminer.com/ireland/proposals-will-end-teaching-of-aba-parents-claim-125149.html>
- Oxford Dictionary. (2005). In Soanes C., Hawker S. and Elliott J. (Eds.), *Pocket oxford English dictionary* (Tenth ed.). Oxford: Oxford University Press.
- Parents Requesting Open Vaccine Education. (2008). *National autism association questions IMO and CDC cover-up*. Retrieved February 1, 2014, from http://www.vaccineinfo.net/releases/IOM_vaccine_autism_report.htm#National

[Autism Association Questions IOM and CDC Cover-Up --
How Far Will They go to Protect Toxic Vaccines](#)

- Parikh, R. (2011). The ads that could help fuel a health crisis. Salon.com. 25 April 2011. Retrieved from:
http://www.salon.com/2011/04/25/vaccine_ad_times_sqaure_poprx/
- Parliament of the United Kingdom (2009). *Autism Act*.
- Parliament of the United Kingdom. (2010). *Fulfilling and rewarding lives: The strategy for adults with autism*. Crown Publications.
- Parsons, S., Guldberg, K., MacLeod, A., Jones, G., Prunty, A., & Balfe, T. (2009). *International review of the literature of evidence of best practice provision in the education of persons with autism spectrum disorders*. Report No. 2. Trim, Co. Meath, Ireland: National Council for Special Education.
- PEAT. (2014). *Parents' education as autism therapists*. Retrieved February 15, 2014, from <http://www.peatni.org>
- Pickler, L., & Elias, E. (2009). Genetic evaluation of the child with autism spectrum disorder. *Pediatric Annual*, 38(1), 26-29.
- Pollak, D. (2009). *Neurodiversity in higher education: Positive responses to specific learning differences*. Wiley. com.
- Powell, S., & Jordan, R. (1997). *Autism and learning: A guide to good practice*. Routledge.
- Price, Waterhouse, and Coopers LLB. (2012). *An evaluation of the special education support service (SESS)*. Dublin: Department of Education and Skills, Government of Ireland.
- Professional Development Service for Teachers (PDST). (2013). *Spring 2013: Professional development schedule- primary*. Report No. 1. Dublin: Professional Development Service for Teachers.

- Psychological Society of Ireland. (2010). *Division of behaviour analysis: Position paper on applied behaviour analysis*. Ireland: Psychological Society of Ireland.
- Ravet, J. (2011). Inclusive/exclusive? contradictory perspectives on autism and inclusion: The case for an integrative position. *International Journal of Inclusive Education*, 15(6), 667-682.
- Reichow, B. (2012). Overview of meta-analyses on early intensive behavioral intervention for young children with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 42(4), 512-520.
- Reichow, B., Volkmar, F. R., & Cicchetti, D. V. (2008). Development of the evaluative method for evaluating and determining evidence-based practices in autism. *Journal of Autism and Developmental Disorders*, 38(7), 1311-1319.
- Remington, B., Hastings, R. P., Kovshoff, H., degli Espinosa, F., Jahr, E., Brown, T., et al. (2007). Early intensive behavioral intervention: Outcomes for children with autism and their parents after two years. *American Journal on Mental Retardation*, 112(6), 418-438.
- Research Autism. (2014). Retrieved January 31, 2014, from http://researchautism.net/pages/about_research_autism/index
- Robison, J. E. (2013,). I resign my roles at autism speaks. Personal blogspot. Retrieved from: <http://jrobison.blogspot.ie/2013/11/i-resign-my-roles-at-autism-speaks.html>
- Rogers, B. (2007). *Behaviour management: A whole-school approach* Sage.
- Rose, R., Shevlin, M., Winter, E., & O'Raw, P. (2010). Special and inclusive education in the republic of Ireland: Reviewing the literature from 2000 to 2009. *European Journal of Special Needs Education*, 25(4), 359-373.
- Rutter, M. (1978). Diagnosis and definition of childhood autism. *Journal of Autism and Childhood Schizophrenia*, 8(2), 139-161.

- Rutter, M. (2005). Aetiology of autism: Findings and questions. *Journal Intellectual Disabilities Research*, 49(4), 231-238.
- Safran, S. P., & Oswald, K. (2003). Positive behavior supports: Can schools reshape disciplinary practices? *Exceptional Children*, 69(3), 361-371.
- Salamanca Statement. (1994). Salamanca statement and framework for action in special needs education. United Nations Educational Scientific and Cultural Organisation.
- Sasso, G. M., Conroy, M. A., Stichter, J. P., & Fox, J. J. (2001). Slowing down the bandwagon: The misapplication of functional assessment for students with emotional or behavioral disorders. *Behavioral Disorders*, 26(4), 282-296.
- Scheuermann, B., Webber, J., Boutot, E. A., & Goodwin, M. (2003). Problems with personnel preparation in autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities*, 18(3), 197-206.
- Schopler, E., Reichler, R. J., DeVellis, R. F., & Daly, K. (1980). Toward objective classification of childhood autism: Childhood autism rating scale (CARS). *Journal of Autism and Developmental Disorders*, 10(1), 91-103.
- Schwartz, I. S., & Baer, D. M. (1991). Social validity assessment: Is current practice state of the art? *Journal of Applied Behavior Analysis*, 24, 189-204.
- Scott, T. M., & Kamps, D. M. (2007). The future of functional behavioral assessment in school settings. *Behavioral Disorders*, 32(3), 146-157.
- Scott, T. M., Liaupsin, C., Nelson, C. M., & McIntyre, J. (2005). Team-based functional behavior assessment as a proactive public school process: A descriptive analysis of current barriers. *Journal of Behavioral Education*, 14(1), 57-71.
- Senju, A., Southgate, V., White, S., & Frith, U. (2009). Mindblind eyes: An absence of spontaneous theory of mind in Asperger syndrome. *Science*, 325(5942), 883-885.

- Shadish, W. R. (2014). Analysis and meta-analysis of single-case designs: An introduction. *Journal of School Psychology, 52*(2), 109-122.
- Shadish, W. R., Hedges, L. V., & Pustejovsky, J. E. (2014). Analysis and meta-analysis of single-case designs with a standardized mean difference statistic: A primer and applications. *Journal of School Psychology, 52*(2), 123-147.
- Shadish, W. R., Zuur, A. F., & Sullivan, K. J. (2014). Using generalized additive (mixed) models to analyze single case designs. *Journal of School Psychology, 52*(2), 149-178.
- Sharpe, D. L., & Baker, D. L. (2011). The financial side of autism: Private and public costs. In M. Mohammadi (Ed.), *A comprehensive book on autism spectrum disorders* (pp. 275- 296). Croatia: Intech Open Access.
- Shevlin, M., Winter, E., & Flynn, P. (2012). Developing inclusive practice: Teacher perceptions of opportunities and constraints in the republic of Ireland. *International Journal of Inclusive Education, 1*-15.
- Shook, G. L., & Favell, J. E. (2008). The behavior analyst certification board and the profession of behavior analysis. *Behavior Analysis in Practice, 1*(1), 44-48.
- Shook, G. L. (2005). An examination of the integrity and future of the behavior analyst certification board credentials. *Behavior Modification, 29*(3), 562-574.
- Shyman, E. (2012). Teacher education in autism spectrum disorders: A potential blueprint. *Education and Training in Autism and Developmental Disabilities, 47*(2), 187.
- Sidman, M. (1989). *Coercion and its fallout* (First ed.). Boston: Authors Cooperative.
- Sinclair, J. (1993). Don't mourn for us. *Our Voice, Autism Network International Newsletter*.
- Sinclair, J. (1998). Language and abbreviations. Autism Network International. Retrieved from:

<http://web.archive.org/web/20080606024118/http://web.syr.edu/~jisincla/language.htm>

Skinner, B. F. (1938). *The behavior of organisms: An experimental analysis*. New York: D. Appleton-Century Co.

Skinner, B. F. (1953). *Science and human behavior*. New York: The Free Press.

Skinner, B. F. (1974). *About behaviorism*. New York: Alfred Knopf.

Skuse, D. H. (2011). The extraordinary political world of autism. *Brain*, 134(8), 2436-2439.

Slagle, R. A. (1995). In defense of queer nation: From identity politics to a politics of difference. *Western Journal of Communication*, 59(2), 85-102.

Special Education Support Service. (2013). *Special education support service (SESS)*. Retrieved July 9, 2013, from <http://www.sess.ie/about-sess/about-sess>

Special Education Support Service. (2014). *Autism spectrum disorders*. Retrieved March 5, 2014, from <http://www.sess.ie/categories/autism-autistic-spectrum-disorders>

Special Education Support Service. (2014). *Calendar of ASD professional development*. Retrieved March 4, 2014, from <http://www.sess.ie/professional-development/calendar/asd>

Speck, M., & Knipe, C. (2005). *Why can't we get it right?: Designing high-quality professional development for standards-based schools* Corwin.

Specter, M. (2013). Jenny McCarthy's dangerous views on vaccination. *New Yorker Magazine*. 16 July, 2013. Retrieved from: <http://www.newyorker.com/online/blogs/elements/2013/07/jenny-mccarthys-dangerous-views.html>

Stagliano, K. (2010). Ari Ne'eman nomination to national council on disability on hold. *Age of Autism*. 29 March 2010. Retrieved from:

<http://www.ageofautism.com/2010/03/ari-neeman-nomination-to-national-council-on-disability-on-hold-.html>

State of Connecticut. (2011). Public Act no. 11-228: An Act Concerning Misrepresentation as a Board Certified Behavior Analyst, State Law U.S.C.

Stevenson, J. L., Harp, B., & Gernsbacher, M. A. (2011). Infantilizing autism. *Disability Studies Quarterly*, 31(3)

Stop.Think. Autism. (2007). NYU child study center: Ransom notes campaign. 8 December 2007. Retrieved from: <http://stopthinkautism.blogspot.ie/2007/12/i-just-opened-email-from-nyu-child.html>

Stratheam, L. (2009). The elusive etiology of autism: Nature and nurture? *Frontiers in Behavioral Neuroscience*, 3(11), 1-3.

Stuart, M. (2011). Autism insurance reform: A comparison of state initiatives. *Indiana Health Law Review*, 8(2), 497-538.

Sugai, G., & Horner, R. (2002). The evolution of discipline practices: School-wide positive behavior supports. *Child & Family Behavior Therapy*, 24(1-2), 23-50.

Sugai, G., & Simonsen, B. (2012). *Positive behavior interventions and supports: History, defining features, and misconceptions*. University of Connecticut: Center for Positive Behavior Intervention & Support.

SurveyMonkey. (2014). Retrieved March 12, 2014, from <https://www.surveymonkey.com>

Sutherland, K., Lewis-Palmer, T., Stichter, J., & Morgan, P. L. (2008). Examining the influence of teacher behavior and classroom context on the behavioral and academic outcomes for students with emotional or behavioral disorders. *Journal of Special Education*, 41(4), 223-233.

Task Force on Student Behaviour. (2006). *School matters: The report of the task force on student behaviour in second level schools*. Dublin: Department of Education and Science.

- Task Group on Autism. (2002). *The education of children and young people with autism spectrum disorders*. Belfast, Northern Ireland: Department of Education, Northern Ireland.
- Taylor, B. (2006). Vaccines and the changing epidemiology of autism. *Child: Care, Health and Development*, 32(5), 511-519.
- The Task Force on Autism. (2001). *Education provision and support of persons with autistic spectrum disorders: The report of the task force on autism* (1st ed.). Dublin: Department of Education and Science, Stationary Office.
- The Teaching Council of Ireland. (2011). *Initial teacher education: Strategy for the review and professional accreditation of existing programmes*. Maynooth, Co. Kildare, Ireland: The Teaching Council of Ireland.
- The Teaching Council of Ireland. (2011). *Policy on the continuum of teacher education*. Maynooth, Co. Kildare, Ireland: The Teaching Council of Ireland.
- The Teaching Council of Ireland. (2012). *Code of professional conduct for teachers*. Second Edition. Maynooth, Co. Kildare, Ireland: The Teaching Council of Ireland.
- The Teaching Council of Ireland. (2014). *Post-primary teacher qualification requirements*. Retrieved February 16, 2014, from <http://www.teachingcouncil.ie/teachers-not-newly-qualified-qualifications-awarded-in-ireland/new-post-primary-teachers.2960.html>
- TheJournal.ie. (2012). *Autism is a theory: Tony Humphreys defends controversial examiner article*. Retrieved January 24, 2013, from <http://www.thejournal.ie/autism-is-a-theory-tony-humphreys-defends-controversial-examiner-article-364800-Feb2012/>
- Thompson, A. M., & Webber, K. C. (2010). Realigning student and teacher perceptions of school rules: A behavior management strategy for students with challenging behaviors. *Children & Schools*, 32(2), 71-79.

- U.S. Department of Education. (2014). *What works clearinghouse*. Retrieved January 22, 2014, from <http://ies.ed.gov/ncee/wwc/default.aspx>
- United Nations. (2006). *Convention for the rights of persons with disabilities*. New York: United Nations.
- United Nations. (2009). *UK ratifies convention for the rights of persons with disabilities*. New York: United Nations.
- United Nations Educational Scientific and Cultural Organization. (1994). The Salamanca statement and framework for action on special needs education.
- United States Congress. (1997). *Individuals with disabilities education act (IDEA)*. Washington DC: US Congress.
- United States Congress. (2004). *Individuals with disabilities education improvement act (IDEA)*. Washington DC: US Congress.
- University of Massachusetts at Boston. (2013). *College of education and human development › department of curriculum and instruction › graduate programs › special education*. Retrieved 14 July, 2013, from http://www.umb.edu/academics/cehd/curriculum/grad/special_education_med
- US Surgeon General. (1999). *Mental health: A report of the surgeon general*. Retrieved 28 January, 2010, from <http://www.surgeongeneral.gov/library/mentalhealth/home.html>
- Van Acker, R., Borenson, L., Gable, R., A., & Potterton, T. (2005). Are we on the right course? Lessons learned about current FBA/BIP practices in schools. *Journal of Behavioral Education*, 14(1), 35-56.
- Vargas, J. S. (2013). *Behavior analysis for effective teaching* Routledge.
- Virués-Ortega, J., Shook, G. L., Arntzen, E., Martin, N., Rodríguez Garcia, V., & Bernardo, M. R. (2009). Professional field and certification in applied behavior analysis: Spain and Europe. *Papeles Del Psicólogo*, 30(2), 155-163.

- Vislie, L. (2003). From integration to inclusion: Focusing global trends and changes in the western European societies. *European Journal of Special Needs Education, 18*(1), 17-35.
- Vismara, L. A., Young, G. S., Stahmer, A. C., Griffith, E. M., & Rogers, S. J. (2009). Dissemination of evidence-based practice: Can we train therapists from a distance? *Journal of Autism and Developmental Disorders, 39*(12), 1636-1651.
- von der Embse, N., Brown, A., & Fortain, J. (2011). Facilitating inclusion by reducing problem behaviors for students with autism spectrum disorders. *Intervention in School and Clinic, 47*(1), 22-30.
- Wakefield, A. J., Murch, S. H., Anthony, A., Linnell, J., Casson, D., Malik, M., et al. (1998). RETRACTED: Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children. *The Lancet, 351*(9103), 637-641.
- Ware, J., Balfe, T., Butler, C., Day, T., Dupont, M., Harten, C., et al. (2009). *Research report on the role of special schools and classes in Ireland*. Report No. 4. Trim, Co. Meath, Ireland: National Council for Special Education (NCSE).
- Warnock, M. (1978). *Report of the committee of enquiry into the education of handicapped children and young people*. London: Her Majesty's Stationary Office.
- Warren, J. S., Bohanon-Edmonson, H. M., Turnbull, A. P., Sailor, W., Wickham, D., Griggs, P., et al. (2006). School-wide positive behavior support: Addressing behavior problems that impede student learning. *Educational Psychology Review, 18*(2), 187-198.
- Watkins, E. (2012). Sick with fear: Popular challenges to scientific authority in the vaccine controversies of the 21st century. *Digital Commons at Providence College*. Retrieved from:

<http://digitalcommons.providence.edu/cgi/viewcontent.cgi?article=1008&context=auchs>

- Watson, S. F. (2009). Barriers to inclusive education in Ireland: The case for pupils with a diagnosis of intellectual and/or pervasive developmental disabilities. *British Journal of Learning Disabilities*, 37, 277-284.
- Weber, K. P., Killu, K., Derby, K. M., & Barretto, A. (2005). The status of functional behavioral assessment (FBA); adherence to standard practice in FBA methodology. *Psychology in Schools*, 42, 737-744.
- Weiss, N. R., & Knoster, T. (2008). It may be nonaversive, but is it a positive approach? relevant questions to ask throughout the process of behavioral assessment and intervention. *Journal of Positive Behavior Interventions*, 10(1), 72-78.
- Weiss, T. C. (2013). *Autism and the affordable care act*. Retrieved February 13, 2014, from <http://www.disabled-world.com/health/neurology/autism/aca.php>
- Westling, D. L. (2010). Teachers and challenging behavior: Knowledge, views, and practices. *Remedial and Special Education*, 31(1), 48-63.
- Williams, D. (1992). *Nobody nowhere: The extraordinary autobiography of an autistic girl* HarperCollins.
- Williams, D. (1994). *Somebody somewhere: Breaking free from the world of autism* Times Book New York.
- Williams, J. M., Beck, T. F., Pearson, D. M., Proud, M. B., Cheung, S. W., & Scott, D. A. (2009). A 1q42 deletion involving DISC1, DISC2, and TSNAX in an autism spectrum disorder. *American Journal of Medical Genetics Part A*, 149(8), 1758-1762.
- Williams, K., Glasson, E. J., Wray, J., Tuck, M., Helmer, M., Bower, C. I., et al. (2005). Incidence of autism spectrum disorders in children in two Australian states. *Medical Journal of Australia*, 182(3), 108-111.

- Willingham, E. (2013). Why autism speaks doesn't speak for me. *Forbes Magazine*. 13 November 2013. Retrieved from:
<http://www.forbes.com/sites/emilywillingham/2013/11/13/why-autism-speaks-doesnt-speak-for-me/>
- Wing, L. (1993). The definition and prevalence of autism: A review. *European Child and Adolescent Psychiatry*, 2(2), 61-74.
- Wing, L., & Gould, J. (1979). Severe impairments of social interaction and associated abnormalities in children: Epidemiology and classification. *Journal of Autism and Developmental Disorders*, 9(1), 11-29.
- Wing, L., Gould, J., & Gillberg, C. (2011). Autism spectrum disorders in the DSM-V: Better or worse than the DSM-IV? *Research in Developmental Disabilities*, 32, 768--773.
- Wing, L., & Potter, D. (2002). The epidemiology of autistic spectrum disorders: Is the prevalence rising? *Mental Retardation and Developmental Disabilities Research Reviews*, 8, 151-161.
- Wing, L. (1996). Autistic spectrum disorders. *BMJ (Clinical Research Ed.)*, 312(7027), 327-328.
- Winter, E., & O'Raw, P. (2010). *Literature review of the principles and practices relating to inclusive education for children with special educational needs*. Trim, Co. Meath, Ireland: National Council for Special Education (NCSE).
- Wolff, S. (2004). The history of autism. *European Child & Adolescent Psychiatry*, 13(4), 201-208.
- Wood, B. K., Blair, K. C., & Ferro, J. B. (2009). Young children with challenging behavior. *Topics in Early Childhood Special Education*, 29(2), 68-78.
- Woods, R. (2001). When rewards and sanctions fail: A case study of a primary school rule-breaker. *Social Policy Report*, 5(3), 181-196.

- World Health Organization. (1990). *International classification of disease and disorders (ICD)* (10th ed.). Geneva: World Health Organization.
- Yang, K. W. (2009). Discipline or punish? Some suggestions for school policy and teacher practice. *Language Arts*, 87(1), 49-61.
- Yeargin-Allsopp, M., Rice, C. E., Karapurkar, T., Doernberg, N., Boyle, C., & Murphy, C. (2003). Prevalence of autism in a US metropolitan area. *Journal of American Medical Association*, 289(1), 49-55.
- Zane, T. (2008). The cost of fad treatments in autism. *The Journal of Early and Intensive Behavior Intervention*, 5(2), 44-51.
- Zarkowska, E., & Clements, J. (1988). *Problem behaviour and people with severe learning disabilities: The S.T.A.R. approach*. London: Chapman.
- Zwaigenbaum, L., Bryson, S., Rogers, T., Roberts, W., Brian, J., & Szatmari, P. (2005). Behavioral manifestations of autism in the first year of life. *International Journal of Developmental Neuroscience*, 23(2), 143-152.

Appendix A

Information Sheet for Participants

You have been selected to participate in a study that is being carried out as part of a Ph.D. thesis in the School of Education at Queen's University Belfast. Before you decide about participation in this survey it is important that you understand the purpose of this research. Please take the time to read the information provided below. Feel free to contact the researcher with any questions or to request clarification on any issues.

Thank you for reading this information.

The education of students with an Autism Spectrum Disorder (ASD) has been a hot topic internationally and in Ireland. Combining this high level of interest with the need to address behaviours that limit educational opportunity and cause increased stress for students and teachers alike, it is important to reflect on training of staff in effective methods to improve behaviour. The teachers' knowledge of these methods and the rationale behind them are indicators of the practical effects of training provided to date. There is also a need to determine the direction of future skills development opportunities.

This research is being undertaken with the co-operation of the Special Education Support Service (SESS). The survey is intended for teachers directly responsible for the education of students with ASD. If you decide to take part you will be asked to complete the online survey that follows after indicating your consent on the next page. You may also be asked to participate in a brief interview. You are free to withdraw from this study at any time.

Result of this survey will be used for the purpose of a Ph.D. thesis, possible journal publications and conference presentations. Details will be altered to protect the identity of all participants in all cases.

Contact details of researcher: Brian Fennell 086-2244422 or email bfennell01@qub.ac.uk

Thank you for taking part in this research.

Appendix B

Online Survey Information

Survey Title:

Survey on Autism and Challenging Behaviour

Researcher:

Brian Fennell

PhD Candidate

Queen's University Belfast

Survey Link:

<https://www.surveymonkey.com/s/ASDTeachersinIreland>

Simply type this link into your address bar and take the survey online through Survey Monkey. All responses are collected and reported online. Complete anonymity is maintained throughout this process.

Thank you for supporting my research!

Appendix C

Hardcopy of online survey

Participant Information Page
<p>You have been selected to participate in a study that is being carried out as part of a Ph.D. thesis in the School of Education at Queen's University Belfast. Before you decide about participation in this survey it is important that you understand the purpose of this research. Please take the time to read the information provided below. Feel free to contact the researcher with any questions or to request clarification on any issues.</p> <p>Thank you for reading this information.</p> <p>The education of students with an Autism Spectrum Disorder (ASD) has been a notable topic of research and discussion internationally and in Ireland. Combining this high level of interest with the need to address behaviours that limit educational opportunity and cause increased stress for students and teachers alike, it is important to reflect on training of staff in effective methods to improve behaviour. The teachers' knowledge of these methods and the rationale behind them are indicators of the practical effects of training provided to date. There is also a need to determine the direction of future skills development opportunities.</p> <p>The survey is intended for teachers directly responsible for the education of students with ASD. If you decide to take part you will be asked to complete the survey which follows after indicating your consent on the next page. You are free to withdraw from this study at any time.</p> <p>Results of this survey will be used for the purpose of a Ph.D. thesis, possible journal publications and conference presentations. Confidentiality of respondents will be maintained at all times and no personal details will be made available to third parties. Details will be altered to protect the identity of all participants in all cases. Participation will not effect service provision to participants in any way.</p> <p>Contact details of researcher: Brian Fennell 086-2244422 or email bfennell01@qub.ac.uk</p> <p>Thank you for taking part in this research.</p>
Consent Form
<p>1. * I confirm that I have read and understand the information page for the following survey and have had the opportunity to ask questions.</p> <p>* I confirm that I am a teacher of students with ASD in the Republic of Ireland and have not received this request for participation in error.</p> <p>* I understand that my participation is voluntary and that I may withdraw at any time.</p> <p>* I agree to take part in this study.</p> <p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p>
Demographic Information

2. What is your current age?

- ☐ 20-29
☐ 30-39
☐ 40-49
☐ 50 and over

3. Gender:

- ☐ Female
☐ Male

4. Where do you work?

- | | | |
|-----------------------------------|-------------------------------------|-------------------------------------|
| <input type="radio"/> Co. Carlow | <input type="radio"/> Co. Kildare | <input type="radio"/> Co. Monaghan |
| <input type="radio"/> Co. Cavan | <input type="radio"/> Co. Kilkenny | <input type="radio"/> Co. Offaly |
| <input type="radio"/> Co. Clare | <input type="radio"/> Co. Laois | <input type="radio"/> Co. Roscommon |
| <input type="radio"/> Co. Cork | <input type="radio"/> Co. Leitrim | <input type="radio"/> Co. Sligo |
| <input type="radio"/> Cork City | <input type="radio"/> Co. Limerick | <input type="radio"/> Co. Tipperary |
| <input type="radio"/> Co. Donegal | <input type="radio"/> Limerick City | <input type="radio"/> Co. Waterford |
| <input type="radio"/> Co. Dublin | <input type="radio"/> Co. Longford | <input type="radio"/> Co. Wexford |
| <input type="radio"/> Dublin City | <input type="radio"/> Co. Louth | <input type="radio"/> Co. Westmeath |
| <input type="radio"/> Co. Galway | <input type="radio"/> Co. Mayo | <input type="radio"/> Co. Wicklow |
| <input type="radio"/> Co. Kerry | <input type="radio"/> Co. Meath | |

5. Which of these settings best describes your teaching environment:

- | | |
|---|---|
| <input type="radio"/> Special School | <input type="radio"/> Resource class (primary) |
| <input type="radio"/> Special class in a primary school | <input type="radio"/> Special class in a secondary school |
| <input type="radio"/> Mainstream classroom (primary) | <input type="radio"/> Resource class (secondary) |
| <input type="radio"/> ABA school | <input type="radio"/> Mainstream class (secondary) |

6. Position held:

- ☐ SEN teacher
☐ Resource teacher
☐ Mainstream teacher
☐ Teaching principal

7. Years of teaching experience (all areas):

- ☐ First year
☐ 2-5 years
☐ 6-10 years
☐ 11-15 years
☐ 16+ years

8. Number of years teaching students with Autism Spectrum Disorders:

- ☐ First year
☐ 2-5 years
☐ 6-10 years
☐ 11-15 years
☐ 16+ years

9. Total number of students you teach this year:

- ☐ 1-3
☐ 4-6
☐ 7-10
☐ 11+

10. Number of students in each of these categories:

	1	2	3	4	5	6	7	8	9	10	11+
Autism Spectrum Disorders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotional Behavioural Difficulties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Challenging Behaviours	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Professional Development

11. In total, how many days have you spent on professional development in the past year?

12. Have you ever participated in training in these areas? Please indicate total number of hours or full days.

Autism spectrum disorders	<input type="text"/>
Challenging behaviour	<input type="text"/>
Applied behaviour analysis	<input type="text"/>
Functional behavioural assessment	<input type="text"/>

13. Please indicate provider(s) of the training you have received.

Autism spectrum disorder	<input type="text"/>
Challenging behaviour	<input type="text"/>
Applied behaviour analysis	<input type="text"/>
Functional behavioural assessment	<input type="text"/>

14. In order to address your own training needs, rate the interest you would have in attending a seminar on these topics:

	Very interested	Somewhat interested	Interested	Not interested
Autism spectrum disorders (ASD)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Challenging behaviour	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Applied behaviour analysis (ABA)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Functional behavioural assessment (FBA)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. How would you rate your understanding of the following? Please choose one:

	Very little	Somewhat	Good	Very Good
Autism spectrum disorders (ASD)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Challenging behaviour	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Applied behaviour analysis (ABA)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Functional behavioural assessment (FBA)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. What experience, if any, have you had using functional behavioural assessment?

	None	Only in training situations	Some	Frequent
Choose one	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. Have you ever implemented a behaviour change programme based on the results of a functional behavioural assessment (FBA)?

☐ Yes

☐ No

18. How successful would you say this programme was?

	Not very successful	Somewhat successful	Successful	Very successful
Choose one	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Autism Spectrum Disorders (ASD)

19. The "triad of impairments" in ASD consist of: social interaction, communication, and...

20. True or false: The perceived rise in prevalence of ASD has been scientifically linked to environmental factors.

- ☐ True
☐ False

21. Many researchers have concluded that ASD are a "multifactorial disorder". The factors which cause ASD are linked to:

- ☐ Ethnicity and socio-economic background
☐ Multiple genes and unknown environmental factors
☐ Poor parental bonding and a non-stimulating environment

22. According to the DSM-IV and ICD-10 the criteria for "autistic disorder" must have an onset age of:

- ☐ 12 months
☐ 24 months
☐ 36 months

23. True or false: ASD are considered a developmental disorder because the impairments manifest during childhood then remain fixed throughout the lifespan.

- ☐ True
☐ False

24. Asperger's syndrome, as a sub-group of ASD, is often used synonymously with the term...

25. True or false: A child described as having "autistic features" because they meet the criterion of only one of the triad of impairments would not be diagnosed with an ASD.

- ☐ True
☐ False

26. According to the generally accepted prevalence rates, in a group of 100 people with ASD, what number of these would be female?

27. True or false: A student with an ASD who has verbal abilities may still require communication aids under certain circumstances, such as stress.

- ☐ True
☐ False

Challenging Behaviour

28. True or false: A behaviour can be determined to be challenging based on its inappropriateness in one setting.

- ☐ True
☐ False

29. A behaviour may be considered challenging if it is likely to involve a significant risk to people's physical well-being or to markedly reduce...

- ☐ the effectiveness of carers/ teachers
☐ access to community facilities
☐ compliance to stated institution/ school rules

30. Numerous researchers have reported a prevalence of challenging behaviour in a population of people with intellectual disabilities as:

- ☐ about 7%
☐ about 15%
☐ about 22%

31. An example of a passive behaviour which can be challenging in many settings is...

32. True or false: A challenging behaviour that has been in a person's repertoire for a long time is equally amenable to change as a newer behaviour.

- ☐ True
☐ False

33. An example of a self-injurious behaviour that is NOT generally considered to be challenging is...

34. All behaviours, including challenging ones, can vary:

- ☐ over time
☐ across settings
☐ in intensity
☐ all of the above

35. True or false: A behavioural approach to challenging behaviour utilizes the function of the behaviour to increase the likelihood of a successful intervention.

- ☐ True
☐ False

36. A challenging behaviour which is suppressed with a disregard for its function may result in...

37. A positive approach to interventions for challenging behaviours would NOT include:

- ☐ use of aversives
- ☐ consistent responses to behaviour
- ☐ building appropriate skills

Applied Behaviour Analysis

38. True or false: Behaviour, defined as the interaction of an organism with its environment, can be measured in various ways, including: frequency, duration, latency, and force.

- ☐ True
- ☐ False

39. The goal of an applied behaviour analysis (ABA) intervention is...

- ☐ to eliminate targeted behaviours
- ☐ to improve socially significant behaviours
- ☐ to reduce stress for carers/ teachers

40. Which stimuli increase the likelihood of a behaviour occurring in the future? Choose as many as apply.

- ☐ positive reinforcement
- ☐ positive punishment
- ☐ negative reinforcement
- ☐ negative punishment

41. As a form of negative punishment, what is removed to effect a "timeout" procedure for a student's behaviour?

42. When approximations of a targeted behaviour are reinforced, we are using which methodology:

- ☐ shaping
- ☐ extinction
- ☐ variable reinforcement

43. True or false: Stimulus fading is when antecedent stimulus is changed while maintaining the target response.

- ☐ True
- ☐ False

44. A behaviour which occurs across different settings, with different people, and over an extended time is said to have been:

45. Which of these is NOT determined as part of a functional behavioural assessment to develop an effective behaviour change programme:

- ☐ antecedent variables
- ☐ physical prompts
- ☐ consequent variables

46. Which one of these statements is TRUE?

- ☐ Punishment is ineffective at reducing target behaviour.
- ☐ Applied behaviour analysis is a behaviour change programme created especially for use with people with autism spectrum disorders
- ☐ Negative reinforcement contingencies serve to increase a targeted behaviour.
- ☐ Reinforcement must follow every occurrence of a targeted behaviour to have a reinforcing effect.

47. True or false: An "ABC" (antecedent- behaviour- consequence) chart is an example of a task analysis.

- ☐ True
- ☐ False

Case Study

48. John Paul is a 16 year old male with a diagnosis of autism. He has severe general learning difficulties. He seems to understand most of what is said to him but when he talks he uses only a few single words. He loves going for a walk in the community. Over the past month or so, John Paul began wetting himself just prior to setting off on his daily walk.

Please explain, in as much detail as possible, what procedures you would use to implement a behaviour change plan.

Thank You

Thank you for your participation in this research!